



Pesticides: In the News and All Around Us

Who decides which pesticides can be approved for use – are these “forever” decisions?

Saturday, September 21, 2019

The 2019 teach-in at MOFGA's Common Ground Country Fair, posted at <https://www.youtube.com/user/MaineOrganicFarmers> and with edited excerpts below, reviewed the process for regulating pesticides. Panelists included **Sharon Tisher, J.D.**, who teaches environmental law and policy at the University of Maine; **Jay Feldman**, executive director of Beyond Pesticides; and **Carol L. Hubbard, M.D.**, of Maine Medical Center. **Nancy Ross, Ph.D.**, adjunct professor of political science at Southern Maine Community College, moderated the teach-in.

Panelists illustrated the regulatory process by discussing the organophosphate insecticide chlorpyrifos, which was banned in 2001 for homeowner use because of its toxicity. Under President Obama, the Environmental Protection Agency (EPA) was in the process of banning it in agriculture, but in July 2019 the Trump administration overturned that action.

Jay Feldman

We're here because MOFGA has become an institution in the state and in the nation in advancing alternatives to chemicals like chlorpyrifos.

Why does a neurotoxin that is known to affect children's brains remain on the market? When Scott Pruitt was EPA administrator, one of his first acts was to reverse the previous administration's proposal to remove chlorpyrifos from the market. Regulating pesticides and toxics has been a political act since the beginning of the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA). Congress mandates what data a chemical manufacturer must submit, and EPA decides which studies and protocols the manufacturer must conduct. Fraud and conflict of interest occur when a chemical company does its own testing, and the chemical review process is not open. A manufacturer provides EPA with data and asks for registration. None of that information is made public until the chemical is on the market. So environmental groups, parents whose children experience poisoning, have to then begin a process of cancellation.

The underlying premise of the federal law is that we need pesticides to grow food, that they have benefit, have value in the market, so we need to keep them on the market and come up with exposure levels that are acceptable risks. Well, what's an acceptable rate of cancer? Of asthma in children, or learning disabilities?

Congress reformed the pesticide law in 1996, directing EPA to come up with a reasonable certainty of no harm – that we're not going to be poisoned by pesticides in our food. That process broke down because the EPA bases its risk assessment on people of average body weight and health without preexisting conditions or other vulnerabilities. So “reasonable certainty of no harm” interprets to “an allowable level of risk, of harm.”

When EPA failed to act on this standard, it was sued by a number of environmental and farmworker groups. Congress said we can't just look at the exposure in your food but in all aspects of your life – e.g., chemical use on your lawn, in your child's school, in your park. Let's aggregate those risks. But Congress also told EPA not to include occupational exposure, so EPA doesn't look at farmer or farmworkers' exposure combinations. Farmworker children, however, do not farm as an occupation, so their exposures are not considered occupational. Studies from Columbia University Center for Environmental Health showed these exposures – but EPA doesn't consider independent scientific literature. It took years for Columbia and environmental, public health and farmer advocacy groups to convince EPA to look at the disproportionate risk on a special group of children. You could have disproportionate risk if you live next to a chemical-intensive farm, drink contaminated water, eat chemically-intensively grown food, and the EPA does not consider this.



Teach-in participants, left to right: Sharon Tisher, Nancy Ross, Carol Hubbard and Jay Feldman. English photo

Finally the Obama administration proposed banning chlorpyrifos based on exposure of farmworker children and from food. Unfortunately the next administration reversed that proposal, claiming more research was necessary. Interestingly, when there's uncertainty in the European Union, that's a mark against that chemical. Some states, due to this EPA reversal, have taken up this issue. Hawaii, New York and California have used their state authority to phase out chlorpyrifos. [Ed. note: In Oct. 2019, the state of California ruled that beginning in early 2020, it will ban the sale of chlorpyrifos.]

Chlorpyrifos is one chemical. Rachel Carson wrote about DDT. You may have heard about Alar. Glyphosate is not being regulated by the EPA, so local governments are banning its use in public areas. School landscaper Lee Johnson used Roundup for many years, got non-Hodgkin lymphoma and took his case to court. A jury awarded him \$179 million. When people look at this, they say EPA's not doing its job. When courts look at the data, they say EPA is the expert, EPA evaluates the science. The court can look at whether EPA followed the proper procedure but can't second guess EPA on the scientific findings.

I've spent about 30 years playing whack-a-mole with various chemicals. We get chemicals banned over decades, but the real solution is a systems change. That's what we do under the Organic Foods Production Act, where the standard says no adverse health effects are allowed. We look at essentiality – are these materials needed to grow our food? We look at compatibility with organic systems: How does this chemical impact biodiversity?

When we campaign to ban individual chemicals, we need to let local and state officials know how deficient chemical regulation is, why we need alternatives, why we should support organic and the transition of conventional farmers to organic. We also have to be concerned about synergistic and endocrine effects of chemicals. Let's see what we can do at our community level to eliminate all these uses. Maine has upheld the right of local municipalities to restrict pesticides within their jurisdictions. Everything we've talked about today is the basis for why your local community should be transitioning to organic practices.

Carol Hubbard

I direct the Developmental Behavioral Pediatric Program at Maine Medical Center, so I work with children with autism and intellectual disabilities, learning disabilities, ADHD and other neurodevelopmental disabilities. I became interested in whether some environmental condition is contributing to the increase in prevalence of these disabilities, especially of autism.

Chlorpyrifos, one of the most widely used conventional insecticides, is used on over a dozen crops. It's been found in traces in ecosystems from Arctic fog to aquatic organisms to conifers in various parts of the United States. The most common occupational exposure for people is farmworkers breathing in the chemical. It's also absorbed through the skin and ingested in drinking water. The most common non-occupational exposure is in residues on produce. Higher levels have been found in the air around agricultural establishments, and it's been detected in human body fluids – breast milk, blood, sperm, meconium (feces of newborns). When it was banned for indoor use, levels in humans dropped. When children switch from nonorganic to organic diets, levels of chlorpyrifos and organophosphates in their bodies drop.

Chlorpyrifos binds to and irreversibly inhibits acetylcholinesterase, an enzyme that causes the neurotransmitter acetylcholine to accumulate. Acetylcholine is involved with nerve cells, signaling skeletal muscle cells, influencing movement, and it has roles in the central nervous system – in learning, cognition, attention and memory. If you have chlorpyrifos poisoning, you return to normal functioning only when your body can synthesize more acetylcholinesterase, which can take a while. There's also a question about whether chlorpyrifos has an impact beyond acetylcholinesterase.

With acute exposures, symptoms may include muscle weakness, increased tear production, weakness, tremors, diarrhea, vomiting and impaired vision. You can also develop more chronic muscle weakness.

Studying subtle effects that don't result in immediate toxicity is best done by comparing people who are and are not exposed over time. That's hard to do, because people are exposed to more than one chemical at a time, and their recall about exposures may not be great. So studies on lab animals are important.

I find it very disturbing that our current administration is very suspicious of epidemiologic studies. Epidemiology is a mainstay of science, with well-respected methodologies. Studies of children of mothers exposed to chlorpyrifos during their pregnancies show impacts on the children, and the general consensus from a number of studies is that even adults can have long-term neurologic impairment in things like executive function (planning and organizing), visual and spatial ability and various forms of memory. Links exist to Parkinson's disease but not to Alzheimer's or ALS. I think the neurodevelopmental and neurological impacts of chlorpyrifos are of bigger concern than links to cancer. It may also be an endocrine disruptor, interfering with testosterone, estrogen and thyroid function.

Pesticides are such a concern for children because they tend to be more exposed – being on the floor more, putting things in their mouths, not washing their hands, and having a greater surface area for their body size. Their blood-brain barrier is immature, so chemicals that get into their bodies may be more likely to cross into their brains, and children may be less able to detoxify chemicals because their livers are immature. One advantage is that they can synthesize replacement enzymes like acetylcholinesterase faster. In 2011 in the general U.S. population, the level of chlorpyrifos was 0.009 mg/kg in adults and 0.025 in toddlers.

Powerful epidemiological studies have shown that exposure to chlorpyrifos in the second and third trimester of pregnancy and even into early childhood can lead to decreased IQ of 1.4 to 7 points, memory problems, slower motor development and increased risk of ADHD and autism. These effects can persist into adolescence and adulthood.

The American Academy of Pediatrics said in 2012 that studies in the United States link early life exposure to organophosphate insecticides to reduced IQ and abnormal behaviors associated with ADHD and autism – a strong statement from a fairly conservative and evidence-based group. Some national and international agencies have also raised concerns or supported bans on chlorpyrifos, mostly due to concerns about neurodevelopmental impacts. The American Academy of Pediatrics, the World Health Organization, the EPA, and most recently the European Food Safety Authority published a statement saying they did not think a safe level of chlorpyrifos exists, and it should potentially be phased out of use.

The American Academy of Pediatrics offers tips for reducing children's exposure to pesticides. Eat organic foods if possible, and wash and scrub produce with water. The Environmental Working Group lists the Dirty Dozen – the most contaminated – and the 15 least contaminated produce items. Store chemicals safely in the home. If using pesticides, read the labels. Don't use bug bombs or broad-spectrum pesticides but use integrated pest management. Keep children away from fertilizer. Avoid Lindane and other strong chemicals when treating lice. People with occupational exposure should not wear contaminated clothing home. If white flags appear on lawns (noting pesticide applications), my husband never lets our children go near those lawns. Try to educate neighbors.

Sharon Tisher

First, from the **Pesticides Quiz**, true or false: Pesticides that have been approved by the EPA for use by farmers are safe when used as directed. False! Even the EPA says if a pesticide manufacturer makes that claim, it has violated federal law.

If the government fails to regulate these products for our safety, why would farmers expose themselves, their children, their workers and their workers' children, their waters and their land, to highly toxic, long lasting chemicals when safer pest control methods exist? As Rachel Carson wrote in 1962, "They fall prey to the blandishments of the hucksters."

Here's a perfect example. In 1994, Eliot Spitzer, then attorney general for New York state, found that Dow was claiming in advertisements and communications with retailers that Dursban (chlorpyrifos) was safe when used as directed, or just safe generally. The state brought an action. Dow agreed that it was breaking the law, asked not to be fined, and promised not to do it again. Yet in 2003, it was doing it again – three years after the Clinton-Gore EPA banned residential uses of chlorpyrifos. Dow wrote to its distributors after that EPA action: "The rules have changed, but the safety of Dursban hasn't changed. We steadfastly believe in the safety of chlorpyrifos"; "If you have pests you want to get rid of, we see no reason why you should not use a product that has been so effectively and safely used"; "The average American wants a safe product ... that gets the job done. Dursban products do that."

How do we compete against that? The Board of Pesticides Control (BPC) is Maine's regulatory authority, and we also have the University of Maine Cooperative Extension, an excellent resource for less toxic alternatives for pest control. A September 20, 2019, Bangor Daily News headline read, "The pesticide Maine potato farmers use is being banned around the world." This is the fungicide chlorothalonil. The EPA classifies it as a probable human carcinogen, but conventional potatoes still get 12 to 15 applications per season. Steven Johnson of UMaine Cooperative Extension has been working for 10 years to persuade farmers that newer, safer products exist. Now that the farmers may not be able to ship to Europe, where chlorothalonil is banned, he thinks he's making headway. Of course your safest route with potatoes and all food purchases is to buy organic.

I covered the BPC for about 10 years for The MOF&G. The BPC, under the Maine Department of Agriculture, Conservation and Forestry, was created in 1971 to regulate pesticides, safeguard the public health and welfare, and protect Maine's natural resources. Covering the BPC was sometimes inspiring, sometimes frustrating. Here are some positive experiences.

First, through a somewhat contentious hearing, Maine was the first state in the nation to refuse to register genetically engineered corn that incorporated a biological pesticide, Bt, and the last state to finally cave in and approve it in 2007. For about 10 years we were the only state where people were not using it.

MOFGA helped develop a regulation mandating that families be told ahead of time about pesticide applications in schools and that pesticides be applied only as a last resort, with the least toxic products.

In 1999 the BPC approved a critical pesticide control area – a special ruling to protect an 11-year-old who developed multiple chemical sensitivity after being over-sprayed with the organochlorine insecticide Guthion. No one could spray within half a mile of her residence. The regulation for getting protection if you have a demonstrated medical need is still on the books.

Another example: The BPC inspects farms at random to see logs of all pesticide applications, what quantity, how often; and what pesticides are stored on the farm. When BPC inspector Ray Connors (now director of compliance for the BPC) was doing a routine inspection in the fall of 1997 at a cranberry farm in Dresden, records showed that the farmer applied chlorpyrifos at 4 pints per acre rather than 3, per label instructions (a

federal violation), and he applied it three times that summer rather than two, as per the label. Cranberry samples had chlorpyrifos residues at four times the legal limit for human consumption. The crop, with an estimated value of \$3,000 to \$5,000, was destroyed, and the farmer was fined \$250.

So if you have a concern about a pesticide or a neighbor's use of a pesticide, the BPC has provisions to deal with those situations. See my Pesticides Quiz on the MOFGA website for details and links.

There is reason for optimism under the new administration. Maine has a new commissioner of agriculture, former MOFGA board member Amanda Beal, and a new BPC director, Megan Patterson, with bachelor's and master's degrees in ecology and environmental sciences from UMaine. Patterson worked to convert a portion of a 2,000-acre conventional farm to organic production. In the '90s, we got a bill passed requiring that the BPC compile an annual report of quantities of specific pesticides sold in Maine. For the following three years, the BPC head said it's impossible, and the requirement was then repealed. Patterson advised me that, without any mandate from the Legislature, she had secured funds this year to track pesticide sales.

Q and A

Asked about spraying for browntail moth, Feldman said that spray programs generally may have short-term efficacy but not long-term, and typically the chemical used exacerbates the problem. The key is to find biological controls and to be concerned with biodiversity. Pests are emerging, he said, because biological diversity is out of whack. Paul Schlein, a member of MOFGA's Public Policy Committee, noted that the effectiveness of any insecticide against this moth is in question; they cost thousands of dollars to apply; and if you're willing to spend that much money, you're better off finding a good arborist to clip the webs.

Asked what to do when neighbors spray, Schlein said, "Hopefully you're in a town like I am with an excellent conservation commission that provides education." He suggested protective clothing and showers to deal with browntail moth caterpillar hairs.

Heather Spalding, MOFGA's deputy director, said the BPC – generally lenient with variance requests – recently denied a land trust's request for a variance to spray two chemicals on a shoreland area to control invasive bittersweet and honeysuckle. "It was very encouraging."

Asked if farmers can be included in pesticide ordinances, Tisher said the Right to Farm Act says farmers can't be sued for nuisance if they follow best management practices, a law she thinks "was incorrectly interpreted by previous departments of agriculture who wanted to prevent local regulation of farms." Trying to regulate farmers in this way, however, could result in a Legislative fight regarding regulating local pesticide use. There have been efforts in the last three Legislative sessions to take away Maine's right to local pesticide ordinances. Feldman noted that drift and runoff are label violations, and people need to speak up when chemical trespass occurs.

Asked if a list of the worst chemicals exists, Feldman said beyondpesticides.org lists the 30 most commonly used pesticides for home and garden, based on toxicity and volume of use, and the 85 chemicals we're typically exposed to.

Asked about the changing composition of the BPC, Tisher noted that for decades the two "public" members of the board had to have a demonstrated interest in environmental issues. "During the LePage administration that environmental commitment requirement was dropped. Last year we tried to put it back in but ended up with a requirement that one of the public members be an applicator, which we don't need. We have plenty of pesticide applicators on the board. It has to be a sustainable applicator, but what does sustainable mean? Not much these days."

An audience member said seven of his neighbors spray the neurotoxin bifenthrin monthly for five months to combat mosquitoes and ticks. He has heard that it doesn't work because the ticks are under leaves, and wind blows mosquitoes away. When neighbors spray, he is notified because he's on the pesticide registry, but he doesn't always get the 24-hour notice required. He covers his organic garden with plastic and leaves the area, and he texts area residents so that they don't let their kids or pets out. Feldman said that the spray has to hit an adult mosquito in flight to kill it, which is virtually impossible, and mosquitoes that are sprayed can develop resistance. Also, sprays can harm beneficial organisms. Some studies associate low-level exposure to bifenthrin with autism and possibly cancer. Focus on personal protection – clothing, when to go outside, screening – he said; and find ways of living with nature.

[< Previous Article](#)

 322

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