



Primary Manufacturer of Chlorpyrifos Drops Out of Market, EPA Continues to Allow Use

Corteva, a spin-off from DowDupont chemical company, will stop producing the highly neurotoxic insecticide chlorpyrifos by the end of this year as a result of declining sales, the company says. Despite the move being viewed widely as potentially good for public health, the company is earning little praise from health advocates for what amounts to a shrewd financial decision that may allow use levels of the brain-damaging pesticide to continue unabated. “Other people are going to continue to profit from harming children,” said Marisa Ordonia, an attorney with the group EarthJustice to Canada’s *National Observer*. “But we’re going to continue to keep fighting to make sure children and farmworkers are protected,” she said.

At odds is the difference between halting production of chlorpyrifos and

cancelling its EPA registration. While Corteva has the ability to voluntarily stop producing its own product, EPA registration permits other generic manufacturers to continue producing the product. And, over the years, there would be nothing to stop Corteva from reintroducing “new” chlorpyrifos products back on to the market.

Chlorpyrifos is an organophosphate insecticide. Chemicals in this class are known to inhibit proper nerve functioning by inactivating the enzyme acetylcholine esterase. Acute exposure to chlorpyrifos can result in numbness, tingling sensation, incoordination, dizziness, vomiting, sweating, nausea, stomach cramps, headache, vision disturbances, muscle twitching, drowsiness, anxiety, slurred speech, depression, confusion, and, in extreme cases, respiratory arrest, unconsciousness, convulsions, and death. The chemical’s use in agriculture means that the general public is regularly exposed to smaller doses of the chemical in food. The most concerning impacts of chlorpyrifos are seen in low-income, fence-line (near chemical production plants), people of color, and farmworker

communities, where working in or living near chlorpyrifos-sprayed fields can mean high rates of chronic exposure.

Studies by the Columbia Children’s Center for Environmental Health (CCCEH) at Columbia University link chlorpyrifos to developmental delays, attention-deficit/hyperactivity disorder problems, and changes to the brain (Rauh et al., 2006 and 2012).

In 2016, EPA, under the Trump administration, reversed a scheduled ban of the chemical after records revealed then-EPA administrator Scott Pruitt met privately with Dow Chemical’s CEO. Since that time, EPA and environmental groups have battled the chemical’s use in the courts and four states have moved to phase out many of its uses, either by statute (HI) or administrative action (CA, NY, MD).

STATEMENT

Beyond Pesticides Stands with Black Lives Matter

In demanding a future that transforms society to ensure equality of opportunity and respect for life, we support the leadership of Black Lives Matter in advancing systemic and institutional change in how we value each other. As an environmental and public health organization, Beyond Pesticides seeks to ensure that we put a stop to disproportionate harm to people of color because of racism and inequality. We strive for a sustainable world that, in a true sense, can only be achieved with foundational change to our social, economic, and environmental norms. In this context, we stand with those demanding an end to systemic racism, white supremacy, and violence in society, and call for a social structure and law enforcement system that honors this goal.



Association of Farmworkers Opportunity Programs

Call for Pesticide Bans as EPA Backslides

Atrazine Ban Urged

The weed killer atrazine causes developmental abnormalities in frogs and research indicates that it affects the endocrine system and reproductive biology of humans. In addition to its agricultural uses in corn, sorghum, and sugar cane production, atrazine is also used on home lawns, school grounds, parks, and golf courses, where exposure to children is common. Nontoxic alternatives are available for all of these uses. Despite the risks identified by EPA—effects to the neuroendocrine system, reproductive and developmental alterations, and impacts on aquatic plant communities—the agency is proposing to increase the allowable levels of atrazine in waterways. Beyond Pesticides, in May, sent a petition to EPA with over 4,000 signatories objecting to its proposal.

... and Paraquat

Joining with 15 farm, farmworker, environmental justice, and conservative organizations, Beyond Pesticides, in December, submitted comments on EPA's risk assessment of the herbicide paraquat that used questionable science to justify continued use of this deadly chemical that is linked to Parkinson's disease. Paraquat is applied annually in the U.S. to more than 100 crops, including cotton, corn, and soybeans. It is quick-acting, non-selective, and restricted use (can be applied by certified applicators and those under their supervision). It is used to control weeds and grasses on agricultural and nonagricultural sites or as a crop desiccant. Paraquat has been linked to numerous adverse health and environmental effects, including increased risk of Parkinson's disease, which has motivated numerous public interest campaigns and proposed legislation to ban its uses in the U.S. The failure of EPA to meet its regulatory responsibility to ban pesticides that do not meet even



istockphoto/sveethoments

the weakest of safety standards reflects the failure of the agency's overall regulatory review process and the urgent need to shift the market to organic practices that create a default prohibition of synthetic pesticides.

... and Dicamba

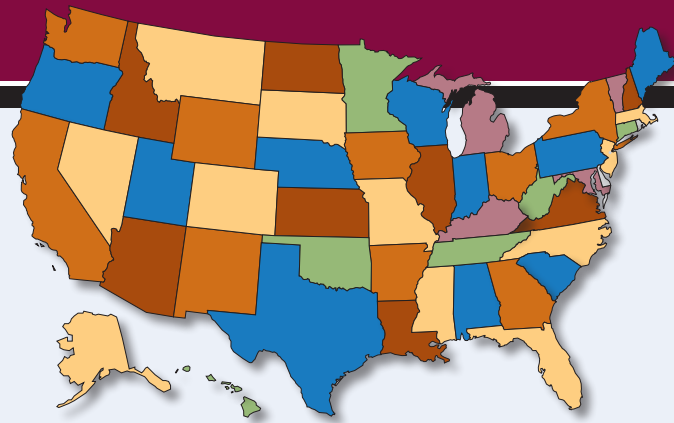
First, Missouri's largest peach farm, Bader Farms, won a lawsuit in February—\$265 million from two multinational agrichemical companies—after the companies' dicamba-based weed killers caused widespread damage to the farm's fruit trees. Bayer's Monsanto and BASF were found to be responsible for negligence in the design of their dicamba herbicides, and failure to warn farmers about the dangers of their products.

Then, in June, the federal Ninth Circuit Court of Appeals, in response to litigation filed by a coalition of farm and environmental groups, led by Center for Food Safety, vacated EPA's 2018 conditional registration of three dicamba weed killer products for use on an estimated 60 million acres of DT (dicamba-tolerant through genetic modification/engineering) soybeans and cotton. Syngenta's new dicamba product, Tavium, was not cited in the lawsuit and may require further litigation. These cases, similar to the inadequate EPA reviews on atrazine and paraquat, underscore the need for transforming agriculture to adopt organic systems

that effectively eliminate the need for toxic pesticides and fertilizers.

"Emergency" Use of Bee-Toxic Neonicotinoid in 10th Year?

Following up on comments that Beyond Pesticides submitted in May with 15 farm, farmworker, and environmental groups objecting to the issuance of a proposed interim decision on bee-toxic neonicotinoid (neonic) insecticides, thousands challenged EPA's potential allowance of an "emergency" use of a neonic for the tenth year in a row. As part of registration review, EPA has not shown that continued neonicotinoid use will meet the legal safety standard under the *Federal Insecticide, Fungicide and Rodenticide Act* (FIFRA). In addition, the repeated use of an emergency provision in FIFRA for bee-toxic pesticide use for nine years makes a mockery of EPA's responsibility, according to Beyond Pesticides and over 3,000 signatories, submitted in June. The groups commented on a request from Maryland, Pennsylvania, and Virginia to use the neonic dinotefuran for yet another year, the tenth, for control of brown marmorated stinkbugs. EPA approved 125 emergency exemptions in eight states from 2011 through 2019 to kill stinkbugs in pome and stone fruits. Dinotefuran presents an alarming hazard to bees and other pollinators. Like other neonics, it is systemic and can indiscriminately poison any insects feeding on nectar, pollen, or exudates. It is also highly toxic to aquatic invertebrates and soil organisms, as well as being highly persistent. Stated in the comments, "In addition to the serious ecological impacts, dinotefuran is toxic to the immune system. This is, of course, is an effect that should be avoided during the coronavirus pandemic—when the immune system is under attack." According to the statement: "EPA must stop approving emergency exemptions in routine cases" and require full registration.



Signals of Environmental Decline, Edging Toward the Insect Apocalypse



iStockphoto/Sadora

Monarchs Decline by Half in One Year

The number of monarch butterflies overwintering (2019-2020) in Mexico is down 53% from last year, according to a count conducted by World Wildlife Fund (WWF) Mexico. While WWF (March 2020) indicates the decline was expected due to unfavorable weather conditions during the species southward migration, other environmental groups are raising red flags. WWF's count found that monarchs occupied seven acres this winter, down from 15 acres last year. Reports indicate that 15 acres is a minimum threshold needed to prevent a collapse of the butterfly's migration and possible extinction.

Research published in *Frontiers in Ecology and Evolution*, "Pesticide Contamination of Milkweeds Across the Agricultural, Urban, and Open Spaces of Low-Elevation Northern California" (June 2020), finds that western monarch milkweed habitat contains a "ubiquity of pesticides" that are likely contributing to the decline of the iconic species. The research provides a grim snapshot of a world awash in pesticides and raises new questions about the U.S. regulatory process that continues to allow these toxic chemicals on to the market without adequate review and oversight. "We expected to find some pesticides in these plants, but we were rather surprised by the depth and extent of the contamination," said Matt Forister,

PhD, biology professor at the University of Nevada, Reno and co-author of the paper. "From roadsides, from yards, from wildlife refuges, even from plants bought at stores—doesn't matter from where—it's all loaded with chemicals. [T]he ubiquity and diversity of pesticides we found in these milkweeds was a surprise," Dr. Forister said.

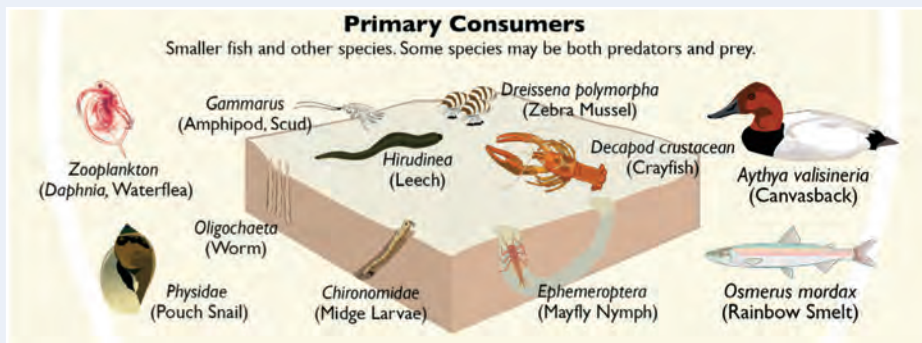
Pesticides Identified as Threat to Fireflies

Research in *BioScience*, "A Global Perspective on Firefly Extinction Threats" (February 2020), sounds the alarm over declines in fireflies, principally attributed to habitat loss, light pollution, and indiscriminate pesticide use. "Our goal is to make this knowledge available for land managers, policy makers and firefly fans everywhere," said study coauthor Sonny Wong, PhD, of the Malaysian Nature Society to *USA Today*. Although there is scant monitoring data on firefly populations, studies conducted over the last decade, alongside anecdotal reports and expert opinion, have led to international concern. This research grew out of a 2010 international meeting in Malaysia, which produced *The Selangor Declaration on the Conservation of Fireflies*, and is part of the Firefly Specialist Group of the International Union for the Conservation of Nature (IUCN), established in 2018 to prevent the extinction of fireflies. Also contributing to the decline is water pollution, tourism, invasive species, and climate change.

Decline in Mayflies Threatens Ecosystems

Research published in the *Proceedings of the National Academy of Sciences*, "Declines in an abundant aquatic

insect, the burrowing mayfly, across major North American waterways" (February 2020), reveals a precipitous decline in numbers of mayflies where they have been historically abundant. The research finds that in the Northern Mississippi River Basin, seasonal emergence of burrowing mayfly (*Hexagenia*) adults declined by 52% from 2012 to 2019; in the Western Lake Erie Basin, from 2015 to 2019, the reduction was a shocking 84%. Neonicotinoid insecticides are a significant factor in this decline because mayflies are extremely vulnerable to their impacts, even at very low exposure levels during the larval stage (as nymphs or naiads) in waterways widely contaminated with the chemicals. *Ephemeroptera*, or mayflies, is an insect order that contains keystone species, on which other species are wholly dependent and without which the ecosystem would undergo drastic change. Given this, a plummeting mayfly "count" is especially alarming because mayflies provide a critical, primary food source in aquatic and terrestrial ecosystems and an important ecosystem service. As the research study notes, "Seasonal animal movement among disparate habitats is a fundamental mechanism by which energy, nutrients, and biomass are transported across ecotones. A dramatic example of such exchange is the annual emergence of mayfly swarms from freshwater benthic [lake or river bottom] habitats. . . Annual . . . emergences represent the exchange of hundreds of tons of elemental nutrients, thousands of tons of biomass, billions of organisms, and trillions of calories worth of energy to the surrounding terrestrial habitat. . . A single emergence event can produce 87.9 billion mayflies, releasing 3,078.6 tons of biomass into the airspace over several hours." According to Purdue



Used with permission. Adapted from *The Life of the Lakes*, MICHU09-400, Michigan Sea Grant, www.miseagrant.umich.edu.

University ecologist Jason Hoverman, PhD, “Mayflies serve critical functions in both aquatic and terrestrial ecosystems. Because of their important role as prey, reductions in their abundance can have cascading effects on consumers throughout the food web.”

Croplands’ Toxicity to Pollinators Skyrockets

A study published in *Scientific Reports*, “County-level analysis reveals a rapidly shifting landscape of insecticide hazard to honey bees (*Apis mellifera*) on US farmland” (January 2020), finds that even as overall volume of insecticide use has decreased, the total “bee toxic load” has increased markedly, due in large part to the use of hazardous seed coatings with insecticides. Findings indicate that, from 1997–2012, the area treated with pesticides saw “a 16-fold increase in oral potency [chemical toxicity] far surpass[ing] a 64% decline in application rate.” The shift to neonicotinoid-treated seed and other application modes of the pesticide follows a pattern by the petrochemical and chemical-intensive agriculture industry to find the next best chemical after facing controversy resulting from the use of highly toxic organophosphate insecticides—linked to hazardous residues, hazards to farmers and farmworkers, chemical drift concerns and liability, and insect resistance. Before organophosphates, the controversy focused on organochlorines, like DDT. However, with the substitution approach to chemical-intensive agriculture, widespread neonicotinoid use has resulted in contaminated

pollen, nectar, and guttation droplets, and brought with it devastating indiscriminate harm to ecosystems, from pollinators to aquatic life, while raising human health concerns. “Several studies have shown that these seed treatments have negligible benefits for most crops in most regions,” said coauthor Christina Grozinger, PhD at Pennsylvania State University. “Unfortunately, growers often don’t have the option to purchase seeds without these treatments; they don’t have choices in how to manage their crops,” she said.

Baby Bees’ Brain Growth Adversely Affected by Neonicotinoid Insecticides



Research out of the Imperial College of London, “Insecticide exposure during brood or early-adult development reduces brain growth and impairs adult learning in bumblebees” (March 2020), finds that bumblebee (*Bombus terrestris audax*) exposure to the neonicotinoid insecticide imidacloprid, through consumption of contaminated nectar and pollen during the larval stage, causes abnormal brain growth in some parts of the bees’ brains, and significantly impairs learning ability. This research expands the body of scientific knowledge on behavioral impacts of neonics on the larval stage of bees, adding to existing research on adult bees.

Glyphosate-Roundup Causes Biodiversity Loss in Freshwater Ecosystems

A study of the weed killer glyphosate (Roundup) use finds that that algae can develop resistance to contamination, but surviving phytoplankton communities are much less diverse. The study, “Community rescue in experimental phytoplankton communities facing severe herbicide pollution” (March 2020), conducted by McGill University researchers and published in *Nature Ecology & Evolution*, raises concerns about biodiversity loss, especially in light of potential stressors, such as pollution and climate change. Phytoplankton matter because their disruption can cause a trophic cascade and impact other organisms. “These tiny species at the bottom of the food chain play an important role in the balance of a lake’s ecosystem and are a key source of food for microscopic animals,” said coauthor Vincent Fugère, PhD.

The adverse environmental and human health effects of glyphosate are now known worldwide, while EPA continues to give the pesticide a green light. Bayer-Monsanto, glyphosate’s primary manufacturer, recently announced a \$10.9 billion settlement with plaintiffs. Its pervasive use and biocidal effects also link the chemical to broader environmental and health issues, such as adverse impacts on soil microbiota and the gut microbiome, as a result of its antibiotic properties.

Fighting Institutional Racism: Safety and Fair Wages Demanded by Washington Farmworkers

Farmworkers walked out of an orchard in Sunnyside, Washington in March to demand improved working conditions. Over a dozen farmworkers cited unacceptable toxic pesticide

exposure, unfair wages, and lack of paid breaks. Their employer, Evans Fruit, owns and farms over 8,000 acres in the state. The workers represent the ongoing struggle for safe working conditions and a living wage when working in the chemical-intensive agriculture industry. Evans Fruit workers said the company provides insufficient protective gear and training before requiring workers to spray pesticides for most of their 12- to 15-hour workdays. Jorge de los Santos, who has worked for Evans Fruit for five years, told the *Yakima Herald*, "My eyes (were) constantly irritating me." Evans Fruit declined to comment,



iStockphoto/PhotoBelo

but worker representatives said the company has been unwilling to negotiate."

Physicians annually diagnose up to 20,000 reported pesticide poisonings

of agricultural workers. Working mothers' unborn children are exposed. A farmworker's life expectancy is 49 years, compared to 78 for the general population. Author and organizer Randy Shaw said in the 2017 documentary on the United Farm Workers, *Dolores*, "The environmental justice movement said that certain environmental hazards are disproportionately impacting on people of color. It wasn't simply stopping DDT, but it was also making the larger point [that] you're only allowing this because of who the workers are, and their race and class background."

Organic Protects Biodiversity

Organic agriculture provides refuge for biodiversity in an increasingly toxic landscape and is more profitable than chemical-intensive agriculture, according to "Landscape context affects the sustainability of organic farming systems" (February 2020), published in the *Proceedings of the National Academy of Sciences*. Organic farms are more profitable than chemical-intensive agriculture, despite slightly lower average crop yields (depending on crop). The value of organic agriculture to biodiversity increases when surrounded by large chemical-intensive fields, but profitability slightly decreases. Small organic farms near urban centers, for example, can be more profitable than large organic farms in remote areas.

Researchers conducted a global meta-analysis of the relationship between landscape context and biotic abundance, biotic richness, crop yield, and profitability. They used landscape metrics that "reflected composition (amount of land cover types), compositional heterogeneity (diversity of land cover types), and configurational heterogeneity (spatial arrangement of land cover types)." Data sets for the study were collected from 148 different studies that span 60 crops on six continents



iStockphoto/hobo-018

across a range of farming practices and landscape types.

Organic sites have 34% higher biodiversity than chemical-intensive crops. This should come as no surprise, as monocultural croplands have become increasingly large and toxic to organisms such as pollinators and birds in the last few decades. Organic agriculture uses a precautionary approach to toxic substances, thereby allowing biodiversity to thrive. For example, a recent study from Finland illustrates how organic animal farms can, in fact, improve wild bird abundance. "A landscape with large field sizes might be an indicator of agricultural intensification in general, with many fields with only one crop and heavier pesticide and herbicide use,"

said Olivia Smith, PhD, lead author of the study. "That's a place where there's not a lot of natural habitat animals can use. An organic farm on that kind of landscape becomes a refuge for species."

Profits from organic agriculture are on average 50% higher than conventional agriculture. Consumers who care about avoiding toxicity, especially families with young children, are driving a surge in organic agriculture. In the U.S., demand far outpaces the supply. While the number of farms in the U.S. is generally declining, the number of organic farms increased 27% between 2012 and 2017, according to data from the USDA National Agricultural Statistics Service.