

Precaution vs. Crisis

Early Warnings Unheeded Lead to Current Environmental Crises

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The world is facing environmental crises that seriously threaten not only human health, but all life on earth. Scientists are discovering new links between agricultural chemicals and a host of “21st century diseases,” including diabetes, obesity, food allergies, heart disease, antibiotic-resistant infections, cancer, asthma, autism, irritable bowel syndrome, multiple sclerosis, rheumatoid arthritis, celiac disease and inflammatory bowel disease—all of which are connected with disruption of gut microbiota. Dramatically, populations of insects—pollinators and others—are plummeting so fast that scientists fear they may disappear altogether, with disastrous effects on the global ecosystem and the life and economy it supports.

BLINDSIDED BY FAILED POLICY

A 2013 report, *Late Lessons from Early Warnings: Science, precaution, innovation*,¹ from the European Environment Agency (EEA) concluded that concerns raised by the scientific community on bee death, genetically engineered (GE) food, and nanotechnology support the need for a precautionary approach to public policy. Significantly, the report concludes that the “precautionary principle,” whereby industry and policy makers take seriously early warnings about potential environmental impacts is “nearly always beneficial.” The report features case studies on environmental impacts, such as mercury poisoning, effects on fertility caused by pesticides, and the impact of pharmaceuticals on some ecosystems, and raises questions about the potential wider impacts of GE crops, nanotechnology, nuclear power, and the effects of pesticides on pollinator populations.

The report lays the blame for numerous environmental crises squarely at the feet of corporations and policy makers who ignore early warnings about environmental impacts. “The historical case studies show that warnings were ignored or sidelined until damage to health and the environment was inevitable,” the EEA said. EEA continues: “In some instances, companies put short-term profits ahead of public safety, either hiding or ignoring the evidence of risk. In others, scientists downplayed risks, sometimes under pressure from vested interests. Such lessons could help avoid harm from emerging technologies.”



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THROWING PRECAUTION TO THE WIND— A FAILURE TO ANTICIPATE PROBLEMS

Without a mandate to follow the precautionary principle, U.S. regulation of pesticides has been susceptible to corporate hype about new technologies. Some prime examples are GE crops, nanotechnology, and systemic pesticides.

GE Foods: Unachieved Sustainability Claims

The EEA report finds that GE crops provide no direct benefit to consumers, are over-hyped, not necessarily safe, and are largely unsuitable for the great majority of the world's farmers. It argues that GE companies manipulate international patent and subsidy systems to gain maximum returns. "Modifying genotypes and capturing them as [intellectual property] through plant variety protection and patents is a far easier means of capturing financial benefits than attempting to [innovate] with cover crops, rotation schedules and composting, farmer-initiated training and education and small scale marketing and credit programs," the report says.

Nanotechnology: Lacking Full Safety Review

The EEA report points out that nanotechnology development has occurred in the absence of "clear design rules for chemists and materials developers on how to integrate health, safety, and environmental concerns into design." While the emerging area of "green nanotechnology" has a focus on preventive design, materials research must be funded at levels significant enough to identify early warnings and potential harms, and regulatory systems must provide incentives for safer and sustainable materials.

Systemic Insecticides: Failed Risk Assessments

Systemic insecticides, such as neonicotinoids, exemplify the failure to anticipate the full range of cascading ecosystem and public health effects. As public and regulatory pressure built to limit human exposure to toxic pesticides on farms and in surrounding communities, compounded by issues of insect and weed resistance, systemic pesticides were advanced as a chemical "solution" to the widespread pesticide exposure problem. Neonicotinoids are applied with a variety of methods, including foliar sprays, granules, soil drenches, tree injections, and, most commonly, coated seeds. With these application

methods—and given the toxicity, longevity or persistence of these chemicals in soil and waterways, and indiscriminate poisoning—broad adverse ecological effects have been, and continue to be, documented.

Some European countries have suspended neonicotinoid seed "dressing" insecticides that are linked to bee decline. In Italy, following the ban, the number of reports of high mortality during spring decreased from 185 cases in 2008 to two cases in 2009. According to the EEA report, evidence of the toxicity of neonicotinoids highlights the major weaknesses of regulatory risk assessment and marketing authorization of pesticides.

PESTICIDE RISK MITIGATION MEASURES ADOPT FALSE ASSUMPTIONS

Faced with evidence of problems caused by pesticides, manufacturers and regulators have used a mitigation strategy to reduce risks. This strategy has been shown repeatedly to be unsuccessful.

Chlorpyrifos: The Power of Vested Interests

At one time one of the most widely used insecticides in the U.S. with 20 to 24 million pounds applied annually, the organophosphate insecticide chlorpyrifos has been linked to neurotoxic effects and thousands of pesticide poisoning incidents. In 2000, EPA and Dow AgroSciences reached an agreement to stop the sale of most home, lawn, and garden uses for chlorpyrifos because of its health risks to children, but allowed continued use in agriculture, for mosquito-borne disease control, and on golf courses. EPA, in 2017, reversed course on its proposal to ban food uses, given findings of adverse effects on children's brain development. Mitigation measures used risk assessment pseudoscience to reduce calculated numbers, while leaving children at risk.



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Antibiotics in Agriculture: Ignoring a Worldwide Crisis in Bacterial Resistance

The World Health Organization has called bacterial resistance “one of the biggest threats to global health, food security, and development today.” As bacteria become resistant to the most commonly prescribed antibiotics, the results are longer-lasting infections, higher medical expenses, the need for more costly or hazardous medications, and the inability to treat life-threatening infections. The development and spread of antibiotic resistance is the inevitable effect of antibiotic use. Bacteria evolve quickly, and antibiotics provide strong selection pressure for those strains with genes for resistance. In spite of this crisis, EPA in 2018 approved two antibacterial chemicals, streptomycin and oxytetracycline, for use as pesticides in citrus production. Both antibiotics proposed for expanded use are important for fighting human disease. Preventive measures—such as those used in organic agriculture—should replace antibiotic use in crop and livestock production, where approximately 80% of antibiotics in the U.S. are used.

“Inerts,” Mixtures, Metabolites, and Environmental Contamination

People encounter pesticides in combination with other chemicals. Whether it is on food, in water, or in the air, a pesticide active ingredient never occurs in isolation. First of all, it occurs with other chemicals in the formulation—so-called “inert” or “other” ingredients or formulants. Second, it is applied to a crop that has received applications of fertilizers and, perhaps, other pesticides. Third, these multiple chemicals break down at various rates, yielding a mixture of active ingredients, formulants, fertilizers, and their metabolites (breakdown compounds) on the crop. Finally, all of these chemicals wash off the field into surface waters where they join chemicals from other fields, sewage treatment plants, urban runoff, and industrial discharges. Those surface waters may recharge groundwater or serve as a source of drinking water. Fish and other animals live in the surface water and may be consumed by humans. Yet, pesticide products allowed on the market are only evaluated for their active ingredient(s).

Triclosan: High Hazard, No Benefit

Triclosan, one of the most prevalent antibacterial compounds in consumer products for decades, has been linked to a range of adverse health and environmental effects from skin irritation, endocrine disruption, bacterial and compounded antibiotic resistance, to the contamination of water and negative impacts on fragile aquatic ecosystems. Since being introduced in 1972 for use in hospital and health care settings, triclosan entered the marketplace in hundreds of consumer products, including antibacterial soaps, deodorants, toothpastes, cosmetics, fabrics, toys, and other household and personal care products—aided by the false public perception that antibacterial products best protect against potential harmful bacteria. Triclosan, while still in toothpaste and other products, after being pulled by manufacturers from liquid soaps and medical products

The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) allows, on top of deficiencies in assessing pesticide hazards, numerous loopholes permitting increased untested pesticide use.

Emergency Pesticide Use Declared Despite Predictability

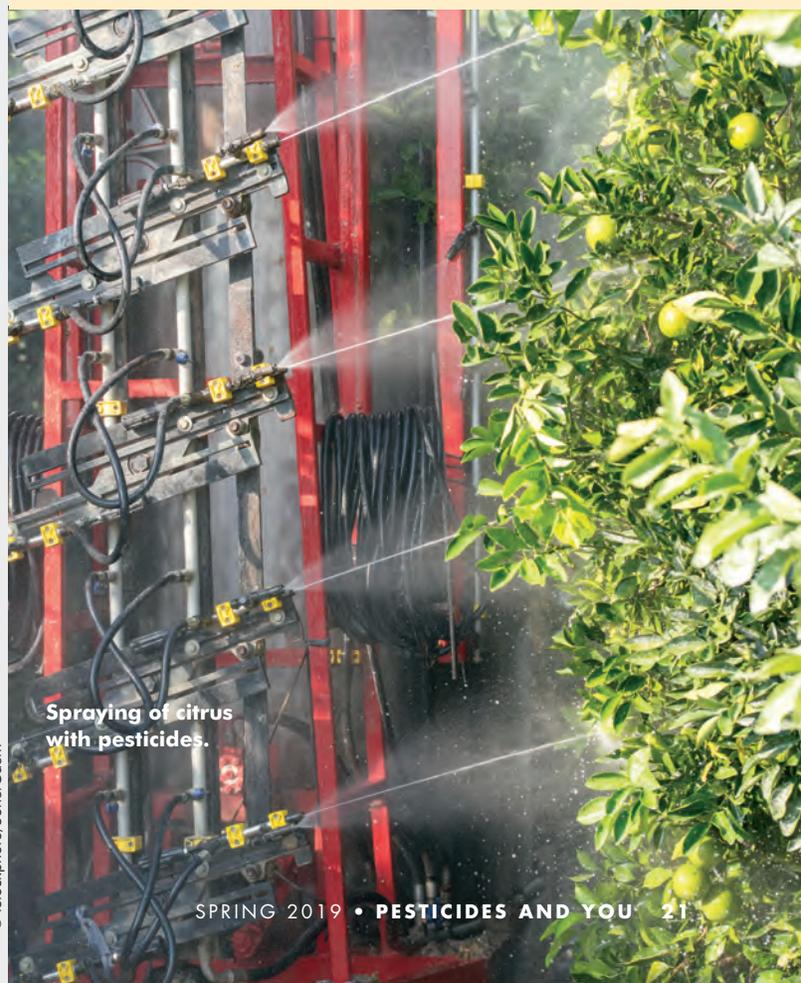
Relying on FIFRA Section 18, or emergency exemption provision, EPA allows the use of pesticides that are not registered for a particular crop, or not registered for use at all—adding to the toxic threat.

“Special Local Needs” Circumvent Law

FIFRA Section 24(c) allows states to approve new uses of a registered pesticide without examination of health and environmental effects associated with new use patterns.

Conditional and Experimental Use Exacerbates Weaknesses

Conditional registration allows pesticides on to the consumer market without all the required data to assess the chemical’s safety—which has led to bee decline, tree death, and increases in human health risks. Under FIFRA Section 5, EPA may issue experimental use permits, though intended to facilitate the collection of data for pesticide registration, that have been used to expand the use of pesticides without notice.



Spraying of citrus with pesticides.



Utility companies generally use wood poles treated with toxic wood preservatives for distribution lines. Utilities expect poles to last 35 to 50 years, requiring the poison to be persistent.

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over the last several years, remains in plastics (toys, keyboards, hair brushes, cutting boards, etc.), clothing, and other consumer products. It has become the most prevalent contaminant not removed by typical wastewater treatment plants—being detected in wastewater, activated sludge, surface water, and sediments.

Wood Preservatives: Underexamined Hazards

Utility companies generally use wood poles treated with toxic wood preservatives for distribution lines. Since a wood pole is potentially a food source or living quarters for organisms, ranging from bacteria and fungi to insects and birds, it is treated with a broad-spectrum poison to protect it—despite the availability of alternative pole materials. Furthermore, utilities expect poles to last 35 to 50 years, requiring the poison to be persistent.

Wood preservatives are all toxic soups—complex combinations of chemicals, whose precise identity is generally unknown and present another example of the failure to address mixtures. An inadequate step at mitigating the risk of wood preservatives was taken when EPA accepted a voluntary cancellation of chromated copper arsenate wood preservatives for residential uses, including playground equipment, after decades of use. Pentachlorophenol, banned in more than 90 countries by international treaty, is still used in the U.S. for utility poles, railroad ties, and wharf pilings. Although creosote is not allowed for use in contact with food, feed, or drinking water, recycled creosote-treated railroad ties are frequently used for landscaping and in garden beds.

INADEQUATE PESTICIDE SAFETY LAW: SERIOUSLY UNPROTECTIVE

When determining the acceptability of pesticide use from a human health perspective, two issues emerge as particularly inadequate in the regulatory assessment: (i) the dramatic deficiency of evaluations that ignore the complex biological systems and exposure realities that must be considered to ensure good health, and (ii) the failure to consider the availability of less or nontoxic management systems for achieving pest management goals. The legal standard for registering a pesticide in the U.S. under the *Federal Insecticide, Fungicide and Rodenticide Act* (FIFRA), which requires a determination of “no unreasonable adverse effects, taking into account the risks and benefits of pesticide use,” illogically does not assess

the essentiality of the pesticide use, including the availability of less toxic alternatives. In addition, the chemical-by-chemical approach used by EPA to assess the acceptability of a pesticide’s hazards and its assumed benefits to society or pesticide users belies the critical scientific need to assess pesticide use in a broader context of exposure, pest management, and prevention. Key to an adequate assessment is always the question of whether there is an alternative to using the chemical that does not involve merely substituting a different chemical into the same management system.

Furthermore, EPA’s human and ecological risk assessments suffer from a disconnect with practice in the real world. Risk assessments assume 100% compliance, with no real inspections on the farm. Non-target exposures through drift and runoff are not controlled, leading to exposures that cannot be calculated. Failure to catch violations in imported products leads to exposure to pesticides exceeding assumed levels or to prohibited chemicals. Additionally, nothing in the calculation of hazards evaluates the impact of pesticide and fertilizer reliance on fossil fuel or natural gas in their production process.

AN URGENT CALL FOR THE PRECAUTIONARY PRINCIPLE

The risk assessment-based federal pesticide law, and state laws that mimic it, must be replaced with a precautionary approach to using pesticide poisons that requires a mandated systems approach to pest prevention. As a part of this approach, least-toxic materials, with cradle-to-grave no adverse effects findings, are only allowed after conducting an alternatives assessment to determine essentiality. These allowed synthetic materials must come off the market on a five-year cycle—governed by a nongovernmental stakeholder body without conflict of interest—unless an objective, public, transparent process with scientific review and a needs assessment results in a super-majority vote to retain their use (a sunset process). This precautionary approach is currently integral to the *Organic Foods Production Act*. The precautionary principle establishes an approach that nurtures rather than kills life and harnesses the power and balance of natural systems, sometimes called ecosystem services.

1 European Environment Agency, 2013. *Late lessons from early warnings: science, precaution, innovation: Summary*. European Environment Agency. http://wedocs.unep.org/bitstream/handle/20.500.11822/19260/Late_lessons_from_early_warnings_II_Summary.pdf?sequence=1&isAllowed=y.