



Pesticide Drift: In the air & in our communities

When pesticides are applied, they can move through the air to nearby homes and schools. They “drift” and settle on playgrounds, laundry lines, inside homes and more. According to scientists, 95-98% of applied pesticides miss their intended mark.¹

Introduction

Drifting pesticides pose serious health risks to many, especially children whose rapidly developing bodies are particularly vulnerable to the effects of exposure to hazardous chemicals.

“Drift” can also damage plants growing in neighboring fields, destroying non-target crops and threatening farmer livelihoods.

However, families and farmers are working together to implement innovative solutions that protect community health, and ensure profitable farming solutions, while preventing harmful pesticide drift.

Detecting Drift

Sometimes drifting pesticides are noticed as a cloud of spray droplets or dust during a pesticide application, or as an unpleasant odor afterwards. But pesticide drift can also be invisible and odorless, present for days, weeks or months after being applied; some volatile chemicals evaporate and contaminate the air.

Some of the most toxic pesticides are drift-prone, and yet this common route of exposure remains largely invisible in public conversation and to policymakers.

Impacts of drift

Bonnie Wirtz and her husband moved to Melrose, Minnesota to start a farm and raise a family. What they weren't planning on were the consequences of living in close proximity to frequent pesticide applications.

Through this event, I realized that even through the air we breathe we can be exposed to these chemicals on a routine basis — no matter where we live. It is horrifying to realize that others can expose my child to chemicals and there is little I can do to stop them.

During one alarming drift incident, Bonnie was at home with her child when the insecticide chlorpyrifos — a known brain toxicant — was being aerially applied to a nearby alfalfa field. It drifted to the Wirtz home, entering their house through the air conditioner, and Bonnie's physical reaction was severe. She immediately had trouble breathing and her heart began racing almost to the point of cardiac arrest.

Bonnie was rushed to the hospital, where health professionals were concerned but unsurprised. She was told by a nurse practitioner that she was not the first to come in with similar reactions.

Bonnie is now working with a group of mothers to educate their communities about the many ways kids and families are exposed to pesticides in their environments. She says many of her friends wonder why their children have more allergies and asthma, and why miscarriage and birth defect rates seem to be going up.

It's my hope that if more people understand that the food they are eating, and that is being produced around them, is affecting their health and the health of the ones they love, it will motivate them to speak out for better food and chemical policy.

TABLE 1

Health Impacts of Pesticide Drift

Acute Exposure ²	Chronic Exposure*
Headaches and excessive sweating	Reproductive harms, including low sperm count, sterility, birth defects, miscarriage and reproductive cancers
Difficulty breathing	Respiratory problems, including asthma
Weakness, dizziness or confusion	Cancer, particularly leukemia, non-Hodgkins lymphoma and brain cancer
Blurry vision	Liver damage
Skin irritation, itchy skin, rashes, bumps, redness, blisters or burning	Damage to the brain or nervous system, including Parkinson's disease
Muscle cramps, pain or twitching	*For more information, see <i>Chronic Health Effects Associated with Airborne Pesticides</i> by Marion Moses, M.D. Available online at: www.panna.org/resources/documents/seconhandDriftAvail.dv.html
Running nose or drooling	
Stomachaches, diarrhea, nausea or vomiting	

Drift & Health

What we know

When pesticides are in the air, we breathe them or absorb them through our skin. Once in the lungs, the chemicals quickly enter our blood stream and spread throughout our bodies.

Pesticides often have no smell, and it is hard to know when they are in the air. Exposure to pesticide drift can cause two types of health problems: (1) immediate or acute poisoning, and (2) health impacts related to ongoing, chronic exposure.

Harm to children

Children, especially babies, are more easily and severely harmed by pesticide drift than adults. They breathe faster than adults, and their bodies and minds are still growing and developing. Exposures to toxic chemicals at critical moments can derail healthy development.

Young children are often close to the ground, playing or crawling, and are more likely to eat, breathe or touch pesticides that drift and settle on the ground or other accessible surfaces. And kids often put their hands and toys in their mouths, making that a common route of pesticide drift exposure.

The systems of the body that “detox” adults from pesticide exposure are not yet well developed in children, and their bodies have a harder time getting rid

of chemicals. Even small doses — *in utero* or after birth — can affect a child’s ability to learn and grow, and may cause allergies, breathing problems or other health issues that can last for life.

Farmworkers & farm families

Farmworker and farm families are most at risk because they often live, work and engage in community activities near pesticide applications. While there are rules that prevent pesticides from being used while working families are in the fields, there are no laws that prevent pesticides from being applied to a neighboring field while workers, children or families are next door.

Many health risks are still unknown

There is still much we don’t know about the health problems that can result from pesticide exposure. Most pesticides have never been tested for human safety. The non-pesticidal ingredients — identified on labels only as “inert” ingredients or “other” ingredients — can also be harmful.



Drift Science

Many different pesticides are prone to drift through air, and often land far from where they're applied. According to the U.S. Geological Survey, "Nearly every pesticide that has been investigated has been detected in air, rain, snow or fog throughout the country at different times of the year."³

In technical terms, there are two main categories of pesticide drift: spray drift and post-application drift.

Spray drift:

- 1) A liquid spray can be carried by the wind, which is often visible. Fine droplets are the most problematic and can drift long distances before settling.
- 2) Sprays can also attach to soil particles, which are carried by the wind. This type of pesticide drift is often visible as a cloud of mist or dust.
- 3) Pesticide drift also happens when gaseous pesticides (called fumigants) are applied and escape into the air. This type of drift is invisible and often odorless, making it difficult to identify using human senses.

Post-application drift:

- 1) Pesticides that turn into vapor and move through the air in a gaseous state can travel for miles. This is known as "volatilization drift" and can last for hours, days or even months after a pesticide application. Because of their chemical properties, some pesticides readily turn into gases, even if they were liquids or oils when originally applied. These pesticides evaporate in the heat of the day, drift through the air for a distance, and re-settle when the temperature drops or they encounter a cool surface, just like water forms on the outside of a cold iced tea on a hot summer day. This process can repeat many times.
- 2) High winds in industrial agricultural areas can create clouds of dust from pesticide-treated fields. This dust is carried on the wind and deposited in yards and parks, as well as in homes and cars, where it can be inhaled or ingested. Children are particularly at risk from this type of pesticide drift because they play on the floor and often put their hands or other objects into their mouths.

Certain types of pesticide use are more likely to lead to pesticide drift. A few examples of common pesticide uses that lead to drift include:

- Aerial spraying, where up to 40% of the pesticide is lost to drift;
- Fogging for mosquitos or other insects;
- Smoke bombs;
- Orchard blasters;
- Structural fumigation, where gases are used throughout a home or building to control termites or other pests; and
- Injections of gaseous pesticides into the soil under plastic in industrial agriculture (commonly used in strawberry and tomato production).

Even the most careful, responsible pesticide applicator cannot control what happens to pesticide droplets once they are released from a plane or helicopter, home yard sprayer or tractor.

And when conditions are right, these droplets end up settling on someone's yard, on another farmer's crops, or on the skin of someone who just happens to be nearby.

Pesticides drift in different ways

To better understand your specific exposure to pesticide drift, it is important to know what combination of pesticides were used when the pesticide drift occurred.

The most dangerous combinations are pesticides that are most prone to drift and that are particularly toxic and linked to acute poisoning or long-term health harms.

Use: www.pesticideinfo.org to look up specific chemicals or pesticide products and learn more about their health harms and chemical properties.

Illegal drift

Depending on the state, pesticide drift or certain types of pesticide drift are illegal. Some states, like Alaska, have prohibitions against significant off-site damage, while Massachusetts prohibits all visible drift from aerial application of pesticides.⁴ Check with your state agency on laws regarding pesticide drift. Information to help you find your state agency is on the next page.

Creating Healthy Communities

Air monitoring data from around the country show that pesticide levels in the air exceed levels considered “safe” by U.S. government agencies, even when pesticides are used according to the letter of the law.

The U.S. Environmental Protection Agency (EPA) is charged with protecting our health and livelihoods from pesticide drift. Unfortunately, EPA’s narrow legal definition of what constitutes pesticide drift excludes several common types.

Our policies need to be changed to better safeguard families and farmers concerned for their health and livelihoods. Local communities can work together to create policies and agreements that ensure healthy farming systems and non-toxic pest management are prioritized.

Have you been exposed to pesticide drift?

First thing to know: pesticide drift is illegal in most states. But making sure that pesticide drift doesn’t happen, or that chemical corporations are held liable, is in our hands.

If you have been exposed to pesticide drift and are concerned about your health, take these steps:

- 1) Leave the area, and warn your neighbors in person or by phone. Encourage anyone who might be exposed to leave the area.
- 2) Seek medical attention.
- 3) Find out what was sprayed, and by whom.
- 4) File a report with the National Pesticide Information Center and the lead pesticide or public health agency in your state, and ask for an immediate investigation, including sampling for residues. To find your state regulatory agency, visit www.npic.orst.edu/reportprob.html#hum.
- 5) Find or start a local community group (formal or informal – a parents’ group, a neighborhood association, etc.) to address pesticide drift.
- 6) Call Pesticide Action Network (PAN) for information and resources to create change.

If you are working with a local community organization on pesticide drift, consider working with Pesticide Action Network (PAN), using our community air monitoring device, the Drift Catcher. PAN scientists work with community members to implement a doable and scientifically rigorous protocol for monitoring the air for pesticides. Farmers, mothers and people across the country have used the Drift Catcher to document pesticides in the air near their homes, schools and business. And they use these data in support of powerful efforts to create change.

Better policies

Thanks to dedicated people around the country, pressure is mounting on policymakers to take action. Communities are working together locally for no-spray protection zones around homes and schools; parents are questioning the wisdom of siting schools in the middle of industrial agricultural lands; and farmers are pulling the plug on drift-prone chemicals and managing pests in innovative new ways.

To help keep communities safe from pesticide drift, policymakers should support:

- Notification of when and where pesticides will be used.
- Protective buffer zones around areas where pesticides are applied.
- Enforcement of current pesticide rules.
- Switching to non-toxic methods of pest management.
- Ensuring U.S. EPA includes exposure to pesticide drift when it makes rules on pesticides.
- Farming policies to implement safer pest and crop management practices.

References:

1. Miller GT. *Sustaining the Earth*, 6th edition. Thompson Learning, Inc. Pacific Grove, California. Chapter 9, Pages 211-216. 2004
2. Roberts, J. and J. Routt Reigart. *Recognition and Management of Pesticide Poisonings*, 6th edition. U.S. EPA. 2013.
3. U.S. Geological Survey Circular 1225. “The Quality of our Nation’s Waters: Nutrients & Pesticides.” U.S. Department of the Interior U.S. Geological Survey, 1999.
4. Feitshans, TA. “An Analysis of State Pesticide Drift Laws Revisited.” *San Joaquin Agricultural Law Review* 20, no. 23 (2011): 23–29.



Pesticide Action Network North America

is part of an international network working to replace the use of hazardous pesticides with ecologically sound and socially just alternatives. To learn more, visit www.panna.org.