Pesticide Drift in Iowa: Genuine Faux Farm

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

Pesticide drift poses a serious health threat to many — especially children, whose developing brains and bodies are vulnerable to the effects of hazardous chemical exposure.

Sometimes drifting pesticides are noticed as droplets, or "spray drift,"and can also be detected as an unpleasant odor. But pesticide drift can also be invisible and odorless — and present for days, weeks or months after applications. This type of drift, when a pesticide rises into the air as a vapor, is known as volatilization drift. Some pesticides are more volatile than others, and some of the most toxic pesticides are prone to drifting in this manner.

Monitoring pesticide drift

Pesticide Action Network's (PAN) Drift Catcher is an air monitoring device used by community partners to collect air samples in places where they live and work. The device consists of a vacuum pump that pulls air through sample tubes at a rate that is measured using a flowmeter. These samples then get tested for pesticide residues. If pesticides are present in the sample, the amount present can be used to calculate the levels of pesticide in the air during the time of sampling.

With the aid of community partners, PAN has collected evidence of pesticide drift in 11 states. Rob Faux of the Genuine Faux Farm used PAN's Drift Catcher to monitor the air in 2015.

Rob and Tammy Faux have an organic farm in Bremer County, Iowa, where they run a community-supported agriculture (CSA) program and a poultry operation. The farm has been in operation since 2005 and certified organic since 2007. The Faux's fields and home are surrounded by conventionally farmed commodity crops.

In 2012, a drift incident occurred where Rob, his livestock, and his crops were exposed to pesticides applied to neighboring fields. Rob was hit with droplets of a pesticide mixture that included the neurotoxic insecticide chlorpyrifos, the active ingredient in the pesticide formulation Lorsban. Other pesticides in the mixture were Stratego and Sniper.

In February 2015, a settlement agreement was reached. You can learn more on the Practical Farmers of Iowa Farminar, available online.[2]

Understanding drift

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.

Depending on the state, pesticide drift or certain types of pesticide drift are illegal.

Drift Catcher Results: Chlorpyrifos in the air

Rob and Tammy were curious about the possibility of pesticide drift even when neighboring farms followed exact application directions. Using PAN's Drift Catcher to test the air, they detected chlorpyrifos near their house and farm in 2015.

The amount of this neurotoxic insecticide found in the air on Rob and Tammy's farm exceeded levels of concern for a one-year-old child or a female of childbearing age (13-49 years of age) — both identified as "sentinel populations" by the U.S. Environmental Protection Agency (EPA) in the most recent risk assessment. Children and the developing fetus are both very susceptible to the harmful impacts of chlorpyrifos.[3]

Science shows clear harm

The neurotoxic effects of this pesticide have been clearly documented in laboratory studies, as well as in studies on children's neurodevelopment. Among the effects found, a study on seven-year-old children found a decrease in IQ that corresponded to an increase in prenatal exposure to chlorpyrifos.[4]

Other effects associated with prenatal exposure to chlorpyrifos include increased odds of mental delay, attention disorders and pervasive developmental disorders.[5,6] The levels of chlorpyrifos detected near the Faux home exceeded levels of health concern for inhalation of volatilization drift for adult and child bystanders (see Table 1).

Pictured above: Rob Faux adjusts the Drift Catcher on his property.
Photo credit: Lex Horan

TABLE 1 **Comparison of EPA's drift bystander risk estimates for chlorpyrifos using Rob Faux's Drift Catcher data**

Dates when samples that had chlorpyrifos were taken at Rob's farm	Average amount of chlorpyrifos in the air according to Rob's data	Were levels of concern exceeded for a 1-year-old child?	Were levels of concern exceeded for an adult bystander?
August 2-3, 2015	55 ng/m^3	Yes	Yes
August 11-14, 2015	45 ng/m^3	Yes	Yes

Table 1: Risk levels in this table are based on EPA's assessment of volatilization drift bystander risk using "steady state margins of exposure."[3] EPA compared past PAN data and found that risk levels for 1 year old children were exceeded for all of PAN's past driftcatching with community partners. Risk levels were exceeded for adults in half of PAN's driftcatching studies.

FIGURE 1 **Rob Faux Drift Catching Results**

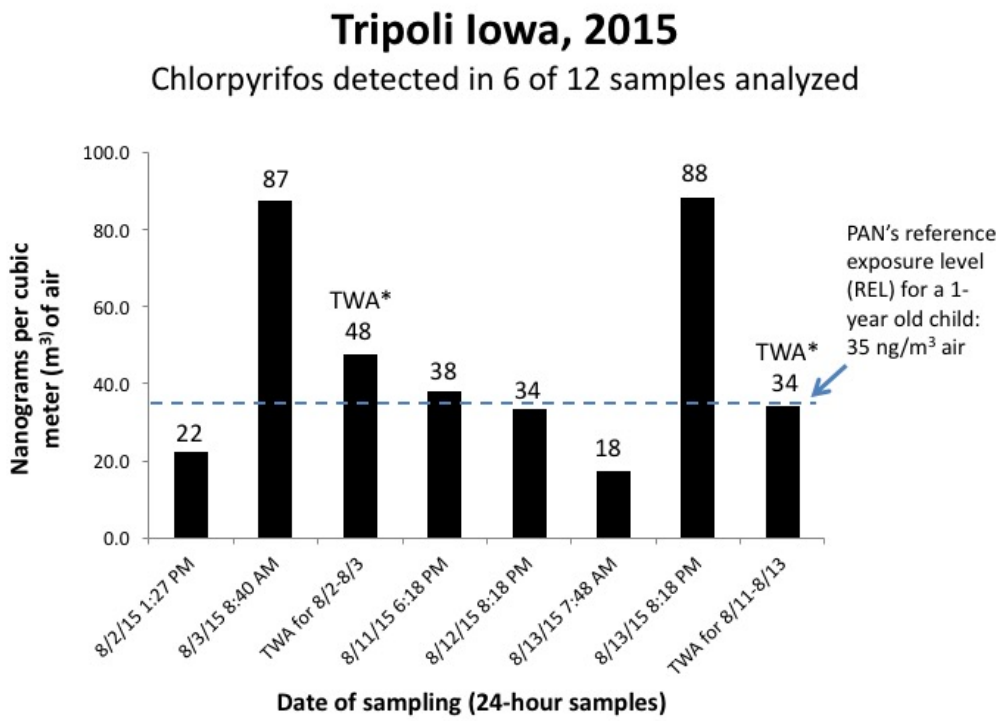

Figure 1: TWA = time-weighted average calculated for the dates specified; REL=reference exposure level.
PAN REL for a female of childbearing age is 52 ng/m^3 air. PAN's REL is based on an additional uncertainty factor, consistent with PAN's recommendations on RELs in the past. This additional uncertainty factor is not used by EPA. Samples are approximately 24 hours.

This brain-harming pesticide has to go

Because of its impact on brains, chlorpyrifos is an especially troublesome pesticide. In 2007, PAN and other partner organizations petitioned the EPA to protect children from exposure to the neurotoxic insecticide chlorpyrifos by banning it. The EPA was ordered to take action by the 9th Circuit Court of Appeals by October 31, 2015. Prior to the Court's order, EPA had already stated publicly that they would likely "partially grant" the petition due to human health risks.

EPA responded by issuing a proposal to revoke food tolerances of chlorpyrifos in 2015. EPA based this proposal on evidence of effects on children's brain development from cohort studies of children exposed to chlorpyrifos before birth, particularly on a study that came from Columbia University. With a revocation of food tolerances, the pesticide would essentially be banned.[3]

In an unprecedented move, EPA Administrator Scott Pruitt ignored scientific determinations that chlorpyrifos is harmful — including analysis from his own agency's scientists — and denied the petition in March 2017. PAN and partners recently went back to court, urging EPA to act on its findings that chlorpyrifos exposure is harmful to children and should be taken off the market.[7]

What do we do about chlorpyrifos?

We already know from EPA scientists — and decades of independent study — that the risks of using chlorpyrifos outweigh the benefits. While use of this neurotoxic insecticide has been declining, representing two percent of pesticide usage as reported recently by USDA, it's still used on many specialty crops and commodity crops — including soybeans and corn.[8]

In addition to exposure via food we all face, people living near fields where chlorpyrifos is used get a "double dose" from pesticide drift in their air.

Successful alternatives to chlorpyrifos exists and are already being implemented by many farmers. One such alternative is to employ environmental pest management (EPM) as a best management practice.

EPM takes a holistic, whole-farm or even landscape approach to growing healthy crops and emphasizes least possible disruption of the agro-ecosystem.

There are multiple strategies to achieve EPM, which fits within the broad discipline of agroecology — a systems-based ecological approach to ensuring sustainable agricultural production within local environmental, social and political contexts. Supporting policies that promote EPM and research for alternatives is crucial.

Most importantly, we need to promote public policies about pesticide drift. In Iowa, a coalition of farmer organizations — including the Iowa Farmer's Union, Iowa Organic Association and Practical Farmers of Iowa — is working together to examine the negative impact that pesticide drift has in Iowa. The coalition is also pushing for better policies to prevent drift and provide more support for farmers whose crops or families are exposed to drift.

For more information, visit www.panna.org/stop-Iowa-drift.

Sources cited

1. Pimentel, David, and Lois Levitan. "Pesticides: Amounts Applied and Amounts Reaching Pests." BioScience 36, no. 2 (February 1986): 86–91.
2. "Pesticide Drift: Response and Compensation," Practical Farmers of Iowa, February 25, 2014. Available at http://practicalfarmers.org/farmer-knowledge/farminar-archive/pesticide-drift-response-and-compensation.
3. U.S. EPA. "Chlorpyrifos: Revised Human Health Risk Assessment for Registration Review." EPA-HQ-OPP-2015-0653-0454, Washington, D.C., November 3, 2016.
4. Rauh V, et al. (2011). "Seven-year neurodevelopmental scores and prenatal exposure to chlorpyrifos, a common agricultural pesticide." Environ Health Perspect. 119(8): 1196–1201.
5. Rauh VA, et al. (2006). "Impact of prenatal chlorpyrifos exposure on neurodevelopment in the first 3 years of life among inner-city children." Pediatrics. 118(6):e1845–1859.
6. Rauh VA, et al. (2015). "Prenatal exposure to the organophosphate pesticide chlorpyrifos and childhood tremor." Neurotoxicology. 51:80–86.
7. In *Re Pesticide Action Network North America and Natural Resources Defense Council, Inc. v. United States Environmental Protection Agency.* No. 14-72794, No. ID: 10383911, DktEntry: 55-1. Petitioners' Motion for Further Mandamus Relief, U.S. Court of Appeals for the Ninth Circuit, filed April 5, 2017.
8. "Pesticide Use in U.S. Agriculture: 21 Selected Crops, 1960-2008." Economic Research Service. U.S. Department of Agriculture, May 2014.

PAN
PESTICIDE ACTION NETWORK • NORTH AMERICA