

Protecting Their Potential

Ensuring California's school children are safe from hazardous pesticides

Pesticide exposure undermines our children's health

Over the past 20 years, incidence of many serious childhood diseases has risen dramatically. Health professionals tell us that we have a "silent pandemic" of learning disabilities and disorders including autism and attention deficit/hyperactivity disorder. Certain childhood cancers — such as brain cancer and leukemia — are increasing, as are rates of childhood obesity and diabetes.¹

Science now points to pesticide exposure as a contributing factor — and in some cases, a key driver — of these trends. Exposures to pesticides in the womb and during the vulnerable first years of life are especially harmful, having lifelong effects that can sometimes be passed to the next generation. Children are most vulnerable to the health harms pesticides can cause due to their rapidly developing brains and bodies, and the larger pound-per-pound dose received relative to adults. Even low-level exposures to certain pesticides can have devastating long-term effects.²

In this critical window of development, children face daily exposure to pesticides at home, at school, and in their communities from pesticide use indoors, on lawns and gardens, and drifting from nearby agricultural fields. Making all these places safe for children to learn and play requires shifting from using harmful pesticides to using safe and sustainable least-toxic alternatives.



Catch the drift? Over half a million students in California's rural areas go to school within 1/4 mile of highly hazardous pesticide use. Many of these pesticides are prone to drift from fields onto school sites, where children can be exposed on playgrounds, athletic fields, and school buses.

California children are especially at risk

Across California, a growing body of evidence points to increasing impacts of pesticides on children's physical health and mental abilities, with several very concerning health impacts on the rise. For example, UC Davis researchers reported a seven- to eight-fold increase in the number of children born in California with autism between 1990 and 2000.³ And researchers at the California Department of Public Health have found an association between exposure to certain insecticides and autism.⁴

The body of research showing an association between exposure to pesticides and children's health problems has mounted in recent years.⁵ On the Central Coast, researchers have demonstrated a link between exposure to pesticides and a reduction in children's IQ. Fumigant pesticides pose a particular risk. They have caused multiple, large-scale poisonings affecting California children and rural communities since the state began collecting illness data in the early 1990s. From 1999 to 2010, fumigants drifting from fields poisoned at least 1400 workers and community members.⁶ The fumigant methyl bromide can cause immediate or acute poisonings and has been linked to lower birth weight, lower birth length, and smaller head circumference.⁷

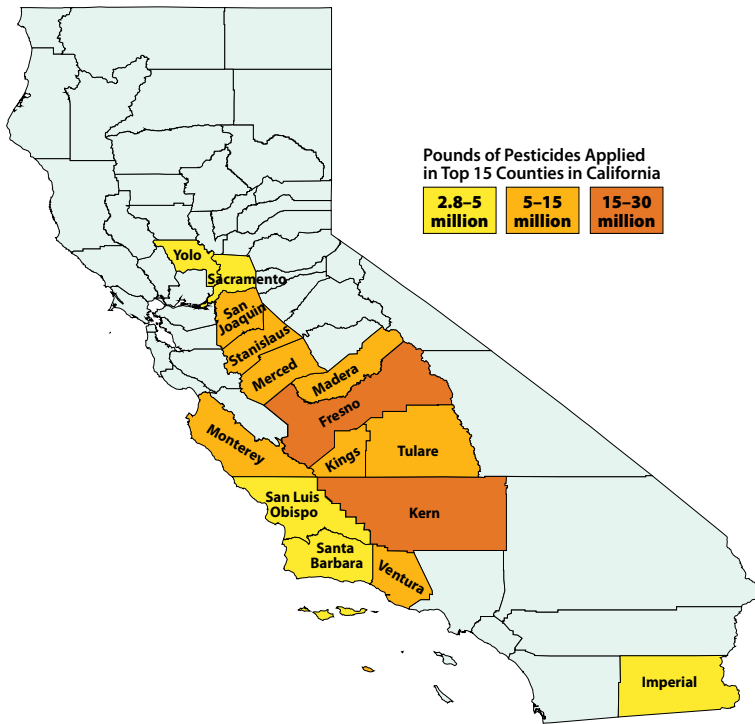
In California's southern Central Valley, a region with some of the most polluted air in the nation,⁸ fumigants are a contributor to smog and the resulting air quality crisis there has spawned an asthma epidemic and alarming increases in respiratory and cardiovascular disease. The Central Valley has the highest level of childhood asthma in California, and it is the primary health-related reason children are absent from schools in the Valley's biggest counties.^{9,10}

Pesticide Use Near California Schools

According to a recent report released by the California Department of Public Health:

- Between 300 and 29,000 pounds of highly hazardous pesticides were applied within 1/4 mile of 226 schools in 2010. This consisted of 144 different highly hazardous pesticides.
- **Fumigants** top the list of greatest amounts of highly hazardous pesticides used near schools.
- **Over 500,000 students** attend school within 1/4 mile of highly hazardous pesticide use; **118,000 students** go to schools within 1/4 mile of the *heaviest* use of these pesticides.
- Latino school children were **91%** more likely than white students to be exposed to the highest levels of highly hazardous pesticides.
- **Central Coast and San Joaquin Valley students** are most likely to attend schools near pesticide use.

Top 15 Counties with Highest Pesticide Use, 2010



Hazardous agricultural pesticides are used in significant quantities close to California's schools

In California, pesticides are applied extensively to crops: 170 million pounds in 2010 alone.¹¹ Over 90% of agricultural pesticides used in the state are prone to drifting away from where they're applied and onto nearby homes, schools, and communities.¹²

The California Department of Public Health's (CDPH) recent study of agricultural pesticide use near the state's public schools analyzed the use of 635 highly hazardous pesticides in the state's 15 counties with the highest agricultural pesticide use.¹³ These 15 counties accounted for about 85% of the state's total agricultural pesticide use in 2010. **One hundred and forty-four highly hazardous pesticides** — those capable of causing cancer, reproductive and developmental harm and damage to the nervous system — **were used within ¼ mile of over 36% of public schools in these counties. Between 300 and 29,000 pounds** of agricultural pesticides were applied within ¼ mile of **226 schools.**

Children in San Joaquin Valley and Central Coast counties are at greatest risk

Highly hazardous pesticides were used within a ¼ mile of almost half of the schools in four Central Valley counties: Tulare (63% of schools), Merced (61%), Stanislaus (51%), and San Joaquin (48%). Fresno had the greatest number of schools (131) with highly hazardous pesticides applied within ¼ mile.

The Central Coast counties of Monterey and Ventura had the largest number of students attending schools located within ¼ mile of the *heaviest* use of highly hazardous pesticides: more than 18,500 and 21,000 respectively.¹⁴ Fresno and Stanislaus counties had the next largest number of students potentially exposed to highly hazardous pesticides — nearly 18,000 and 13,000 respectively. (See table on next page.)

Top 10 Pesticides used within 1/4 mile of schools						
TOP 10 PESTICIDES (IN POUNDS USED/year)	HEALTH EFFECTS	POISON	CANCER	FERTILITY, PREGNANCY, CHILD DEVELOPMENT	HORMONES DISRUPTOR	BRAIN & NERVOUS SYSTEM DAMAGE
	TOP 5 ARE FUMIGANTS	Chloropicrin	✓	✓	?	?
1,3 dichloroprene		✓	✓	?	?	
Methyl bromide		✓	✓	✓	✓	✓
Metam-sodium		✓	✓	✓	✓	
Potassium n-Methyl-dithiocarbamate		✓	✓	✓	?	
Captan	✓	✓	?	?		
Pendimethalin		?	?	✓		
Chlorpyrifos	✓		?	✓	✓	
Paraquat dichloride	✓		?	✓	? (**)	
Malathion	✓	?	?	✓	✓	

HEALTH EFFECTS LEGEND:

- Causes immediate poisoning
- Can cause cancer
- Problems with fertility, pregnancy and/or child development
- Suspected to disrupt hormones
- Can damage the brain and nervous system

STATUS LEGEND:

- ?
- ✓

(*) This has been a source of controversy in California where state scientists and risk managers disagree over the strength of evidence of carcinogenicity.

(**) There is a strong body of evidence linking exposure to paraquat and increased risk of Parkinson's disease.

Source: CDPH, pesticideinfo.org

Chlorpyrifos

A brain toxin too dangerous for home use

Chlorpyrifos — the eighth most common pesticide used near the schools studied — was banned for home use in 2001 by the U.S. Environmental Protection Agency because of the damage it can cause to children's development. A nervous system poison, it is still widely used on crops throughout California and can easily drift away from where it is applied — putting children living near fields at great risk. The pesticide has been found in the air and bodies of San Joaquin Valley residents at levels of concern. *

* "Airborne Poisons: Pesticides in our Air and in our Bodies." Californians for Pesticide Reform, May 2007.

Fumigants are the most heavily used pesticides near schools. The top five pesticides (by pounds applied) used within ¼ mile of the California schools studied were all fumigant pesticides — among the most toxic chemicals used in farming. Fumigants — pesticides injected into the soil to sterilize it before crops are planted — are applied at rates up to 400 pounds/acre and account for about 20% of all pesticides used in California. Fumigants easily drift away from fields, and many are capable of causing cancer, reproductive and developmental harm, groundwater contamination, and acute poisoning.

Children in Ventura and Monterey counties are most at risk of fumigant exposure: these two counties have the greatest number of students attending schools within ¼ mile of the highest fumigant use.

Latino school children at greater risk

Latino schoolchildren bear the greatest brunt of pesticide exposure. Seven of the top ten counties with heaviest use of pesticides within ¼ mile of schools are in the San Joaquin Valley. While Latinos comprised 54% of the student population in the 15 counties, Latinos were 46% more likely than white students to attend schools with use of highly hazardous pesticides within ¼ mile and 91% more likely to attend schools with the highest use of highly hazardous pesticides. In April 2011, the U.S. Environmental Protection Agency issued a finding of



Too close for comfort: Just a few feet from homes and schools in rural California, applicators fumigate the soil.

racial discrimination on a civil rights complaint issued over a decade earlier — *Angelita C. v. California Department of Pesticide Regulation (DPR)*. U.S. EPA agreed that Latino schoolchildren suffered disparate adverse effects from the application of methyl bromide between 1995–2001. Despite the finding, EPA and DPR have allowed the discrimination to continue by permitting the continued application of dangerous pesticides and fumigants near California’s rural schools.

Children — especially in the Central Coast and the San Joaquin Valley — face greatest exposure to highly hazardous pesticides (HHPs) at schools*

County	Total agricultural pesticides applied in 2010 (million lbs)	% schools with HHPs used within ¼ mile	# of students attending schools with heaviest use of HHPs within ¼ mile
Fresno	27.8	38.9	17,790
Kern	21.5	19.6	6,437
Tulare	8.9	63.4	8,587
San Joaquin	8.7	47.5	9,520
Madera	8.6	42.5	1,047
Monterey	8.2	46.7	18,525
Merced	7.2	61.2	9,873
Ventura	6.5	30.3	21,193
Kings	6.1	29.0	2,267
Stanislaus	5.1	51.4	12,725
Imperial	4.2	30.4	863
Santa Barbara	4.1	45.4	9,036
Sacramento	3.3	8.0	202
San Luis Obispo	2.6	29.3	298
Yolo	2.5	29.7	501

Source: CDPH report. * For a breakdown listing the top 10 pesticides applied near schools in each of the 15 highest pesticide use counties in 2010, please see Appendix 5 of the CDPH report.

Strawberry Pesticides Some of the most dangerous

Eighty-eight percent of the nation’s strawberries are grown in California — over 38,000 of acres in 2011, primarily in Monterey, Santa Barbara, Santa Cruz, and Ventura counties.¹ Over 9.2 million pounds of pesticides are used on strawberries with fumigants accounting for over 80% of the total amount of those pesticides. The main strawberry fumigants are chloropicrin, methyl bromide, 1,3-dichloropropene and metam-sodium.² In counties such as Monterey, Santa Cruz and Ventura, strawberry fields are located very close to homes and schools — putting children in those counties at risk.³



1. California Strawberry Commission, “Market Information,” 2013.
2. California Department of Pesticide Regulation’s Pesticide Use Reporting Data, 2010.
3. California Department of Pesticide Regulation’s Pesticide Use Reporting Data, 2010.

Teacher Knows Best

I've been a teacher in the Pajaro Valley for 13 years. During that time I have seen an increase in the number of students who have difficulty concentrating and delays in development that require special attention to access their grade-level work.

Many of our students face significant pesticide exposure: before they are born from mothers who work in the fields, from residue left on family members' clothing and vehicles, and many years of pesticides drifting from fields onto schools. How could this exposure *not* have an effect on their developing brains and bodies?

— Sarah Henne, Pajaro Valley school teacher and union representative for the Pajaro Valley Federation of Teachers

Recommendations: We must protect our children from pesticides

Improve local, state, and national policies now to better protect children from pesticides. Investing now in reducing exposure to pesticides will reduce health care costs over the long term, protecting today's children, tomorrow's adults, and future generations.

Policymakers should act immediately to:

- 1** Transition California to safe, sustainable fumigant alternatives by 2020.
- 2** Establish consistent, large, health-protective "protection zones" statewide to maximize distance between schools and where highly hazardous pesticides are applied.
- 3** Reduce the use of highly hazardous pesticides.
- 4** Require that all highly hazardous pesticides be categorized as Restricted Use materials that need a permit so that local officials have more oversight over applications.
- 5** Require 48-hour advance notification of highly hazardous agricultural pesticide use near schools.
- 6** Require site-specific reporting for all pesticide applications on school property.
- 7** Create an electronic, publicly accessible database tracking site-specific agricultural pesticide applications.
- 8** Establish a comprehensive air monitoring program and conduct annual analysis noting trends in pesticide use near schools, childcare centers and other sensitive sites (e.g. homes, labor camps, environmentally-sensitive areas).

Endnotes

- 1 "A Generation in Jeopardy: How pesticides are undermining our children's health and intelligence." Pesticide Action Network, October 2012.
- 2 Roberts, James R. and Catherine J. Karr. "Technical Report: Pesticide Exposure in Children." *Pediatrics*, Vol. 130 No. 6 December 1, 2012.
- 3 Hertz-Picciotto, Irva and Lora Delwiche, "The Rise in Autism and the Role of Age at Diagnosis," *Epidemiology*, Volume 20, Number 1, January 2009.
- 4 Eric M. Roberts et al. *Environ Health Perspect*. 2007 October; 115(10): 1482–1489. Maternal Residence Near Agricultural Pesticide Applications and Autism Spectrum Disorders among Children in the California Central Valley
- 5 "A Generation in Jeopardy: How pesticides are undermining our children's health and intelligence." Pesticide Action Network, October 2012.
- 6 California Department of Pesticide Regulation. CalPIQ Pesticide Illness Query database. Available at: <http://apps.cdpr.ca.gov/calpiq/>. Accessed August 12, 2013.
- 7 Gemmill, Alison et al. "Residential Proximity to Methyl Bromide Use and Birth Outcomes in an Agricultural Population in California." *Environmental Health Perspectives*: April 19, 2013.
- 8 See the American Lung Association's "State of the Air 2013" Report" <http://www.lung.org/associations/states/california/advocacy/fight-for-air-quality/sota-2013/state-of-the-air-2013.html>. Accessed October 10, 2013.
- 9 Rondero Hernandez, V., Sutton, P., Curtis, K. A., & Carabez, R. (2004). *Struggling to breathe: The epidemic of asthma among children and adolescents in the San Joaquin Valley*. Fresno: Central California Children's Institute, California State University, Fresno. Pages 4 & 11.
- 10 Kern County Superintendent of Schools. <http://kcsos.kern.org/ConditionsOfChildren/asthma>
- 11 In 2011, 192 million pounds of agricultural pesticides were reported used in California, according to the California Department of Pesticide Regulation. Since the CDPH report' analysis is based on 2010 data, we have cited 2010 data in this document.
- 12 "Secondhand Pesticides: Airborne Pesticide Drift in California." Californians for Pesticide Reform, 2003.
- 13 CDPH defines highly hazardous pesticides as falling into one or more of the following categories: carcinogens, reproductive and developmental toxicants, cholinesterase inhibitors (nervous system toxicant), Toxic Air Contaminants, fumigants, and "pesticides of emerging concern." CDPH defines "pesticides of emerging concern" as active ingredients identified as high priority chemicals for risk assessment according to CDPR or active ingredient from DPR database that are on the DPR air monitoring list. See CDPH report for more details.
- 14 The "heaviest use of highly hazardous pesticides" is defined as between 300 and 29,000 pounds of pesticides used within ¼ mile of a school. CDPH refers to this as the top quartile of pesticide use.

CPR Steering Committee

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