



RESEARCH & ACTION: AGRICULTURAL PESTICIDE USE AND ORGANIC FOR ALL

May 20, 2020

**Kendra Klein, PhD
Senior Staff Scientist
Friends of the Earth**



Plummeting insect numbers 'threaten collapse of nature'

The Guardian
February 10, 2019



Common weed killer glyphosate increases cancer risk by 41%, study says

February 15, 2019



USDA Pesticide Data Program

77% of ~10,000 samples had residues (2016 data)

APPLES

47 different pesticide residues found

6 Known or Probable Carcinogens

16 Suspected Hormone Disruptors

5 Neurotoxins

6 Development or Reproductive Toxins

11 Honeybee Toxins



www.whatsonmyfood.org
Pesticide Action Network

Exposure is ubiquitous



Umbilical Cord Blood Study

10 infants tested showed an average of

- 200 industrial compounds and pollutants, including
- 21 out of 28 pesticides tested

Environmental Working Group, 2004

www.ewg.org/reports/bodyburden

Cumulative exposures add up

Organophosphate pesticides are associated with neurological impairment

A 2009 study found that ~ 40% of US children may be exposed at a level greater than benchmarks for neurological impacts



Pregnant women, infants, children, and adolescents are more vulnerable





Between $\frac{1}{3}$ and $\frac{1}{2}$ of all farmworkers in America reside in California

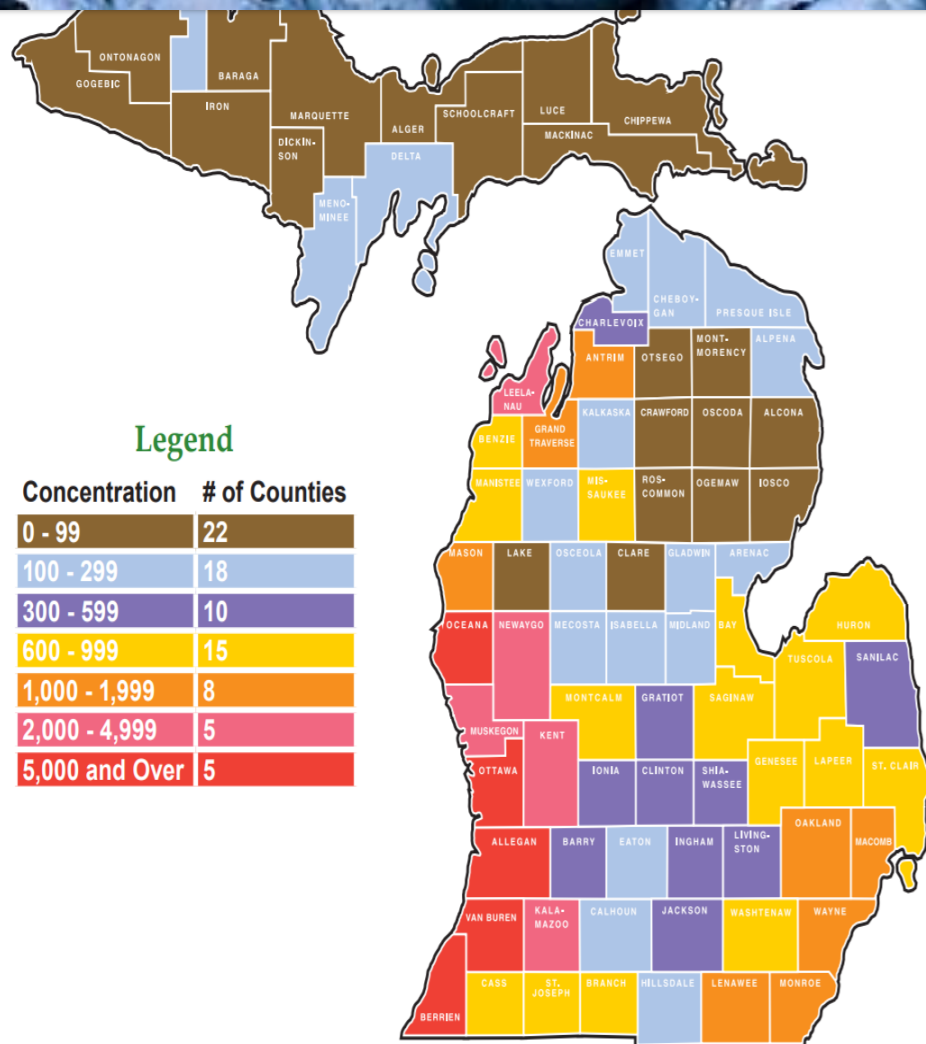
Roughly 500,000 - 800,000 people



- Food&Ag is second-largest industry
- Over 300 ag commodities
- #1 nationwide in blueberries, tart cherries, Niagara grapes, cucumbers for pickles, and flowering plants.

MICHIGAN FARMWORKER DEMOGRAPHICS (2013)

- 49,135 migrant and seasonal farmworkers
- 94,167 farmworkers and accompanying non-farmworker household members



Farmworkers, their families, and rural communities are more vulnerable

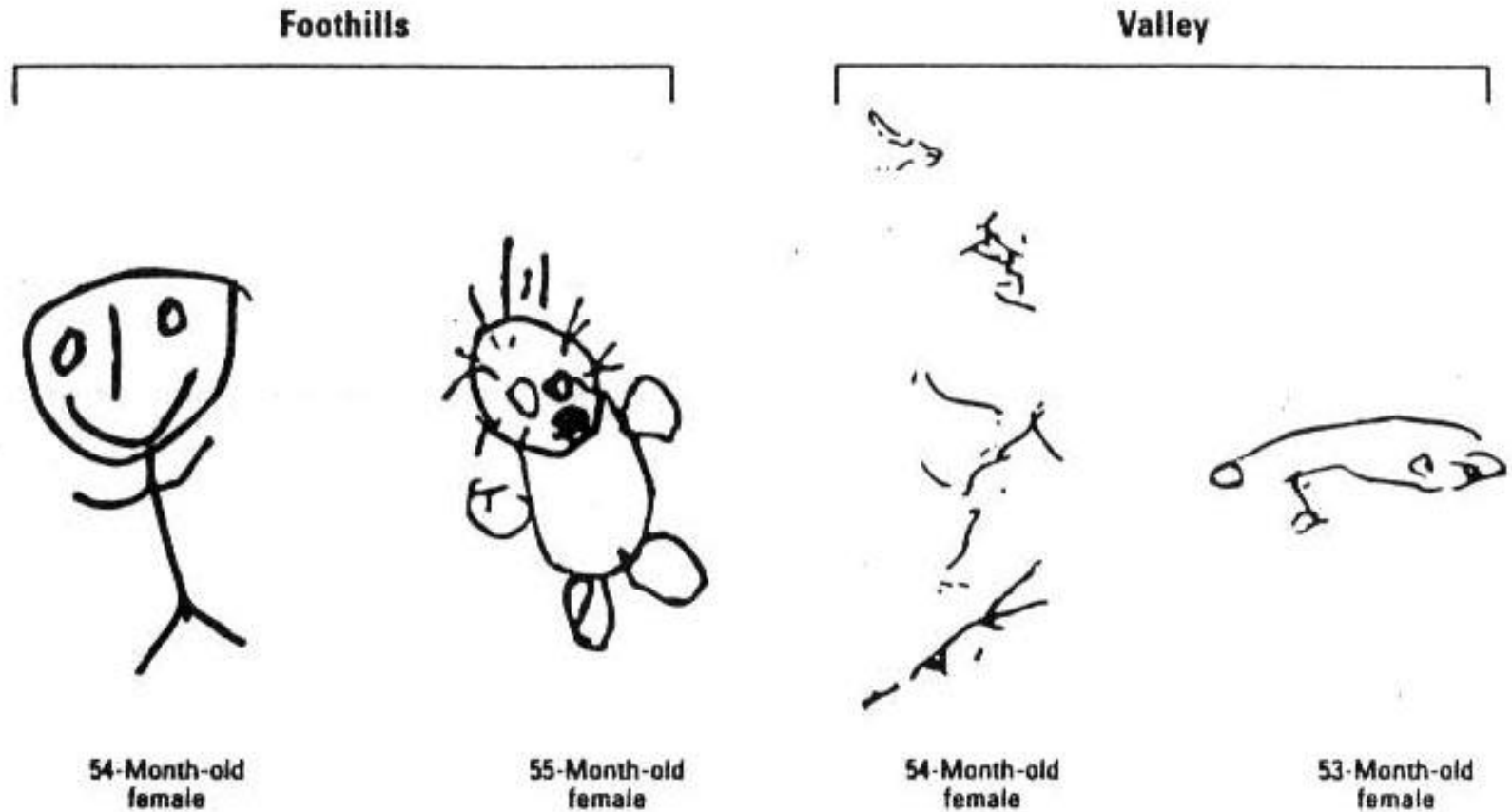


- Mothers who live within a mile of fields where toxic pesticides are applied had a 60% higher chance of having kids with autism
- The link is strongest for the insecticide **chlorpyrifos**

Shelton *et al.* (2014). Neurodevelopmental Disorders and Prenatal Residential Proximity to Agricultural Pesticides. *Environmental Health Perspectives*.

Yaqui Valley Study

Guillette, 1998



<http://www.pbslearningmedia.org/resource/envh10.sci.life.eco.pesticidestudy/the-effects-of-pesticides-on-children/>



Salinas Valley, California

“The Salad Bowl of the Nation”

Over 35 crops grown. . .



Lettuce
Broccoli
Peppers
Celery
Cauliflower
Grapes
Strawberries

CHAMACOS

UC Berkeley

Center for the Health Assessment of Mothers and Children of Salinas

601 pregnant women enrolled in 2000

Mothers' exposure to organophosphate pesticides during pregnancy was associated with:

- Shorter duration of pregnancy
- Poorer neonatal reflexes
- Lower IQ and poorer cognitive functioning in children
- Increased risk of attention problems in children

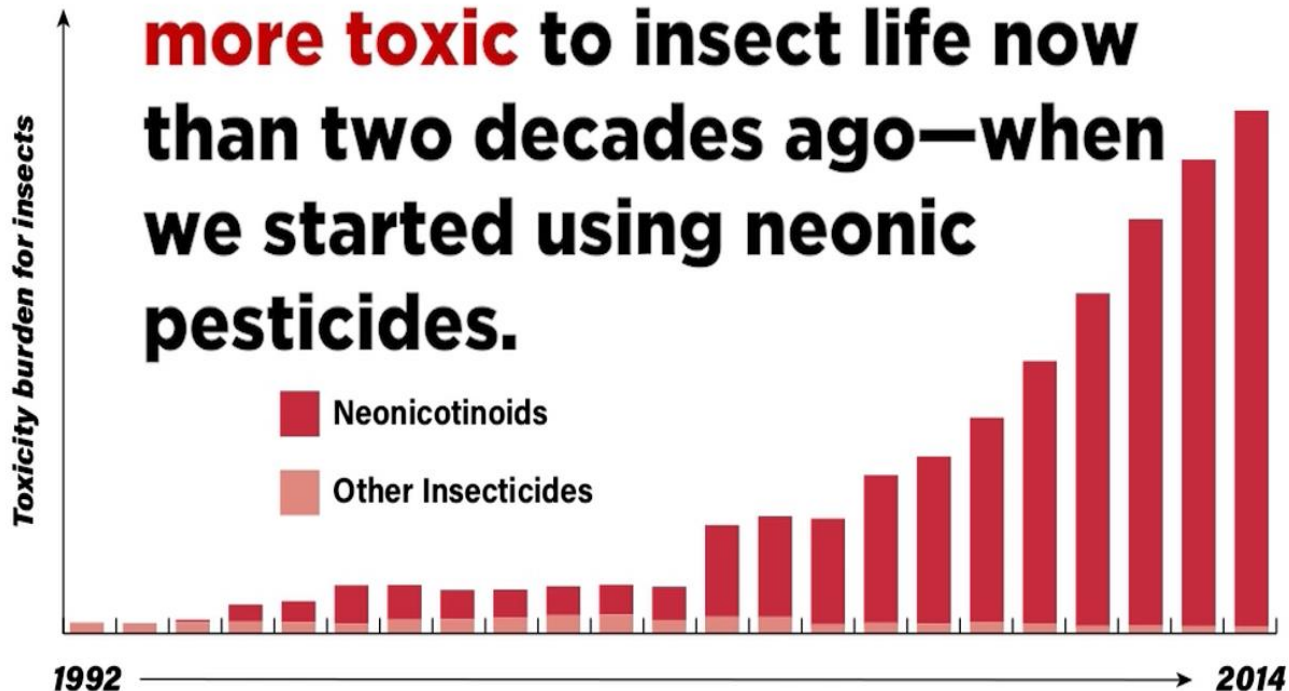




40% of all pollinating species
are on the brink of extinction



U.S. Agriculture is 48 times more toxic to insect life now than two decades ago—when we started using neonic pesticides.



www.foe.org/toxic-acres

Farmers are on a “pesticide treadmill”

Worldwide, approximately 368 weed varieties and 540 insect species have developed resistance to pesticides.

Ninety percent of Iowa farmers reported feeling that “pest management is a never-ending technology treadmill” in a 2014 poll.

Despite increasing use of pesticides, farmers are losing more of their crops to pests today than they did in the 1940s.

<https://foe.org/top-ten-truths-pesticides/>

<http://www.panna.org/gmos-pesticides-profit/pesticide-treadmill>

WHO WINS? WHO LOSES?

The “Big 4” Agrichemical Companies



MONSANTO

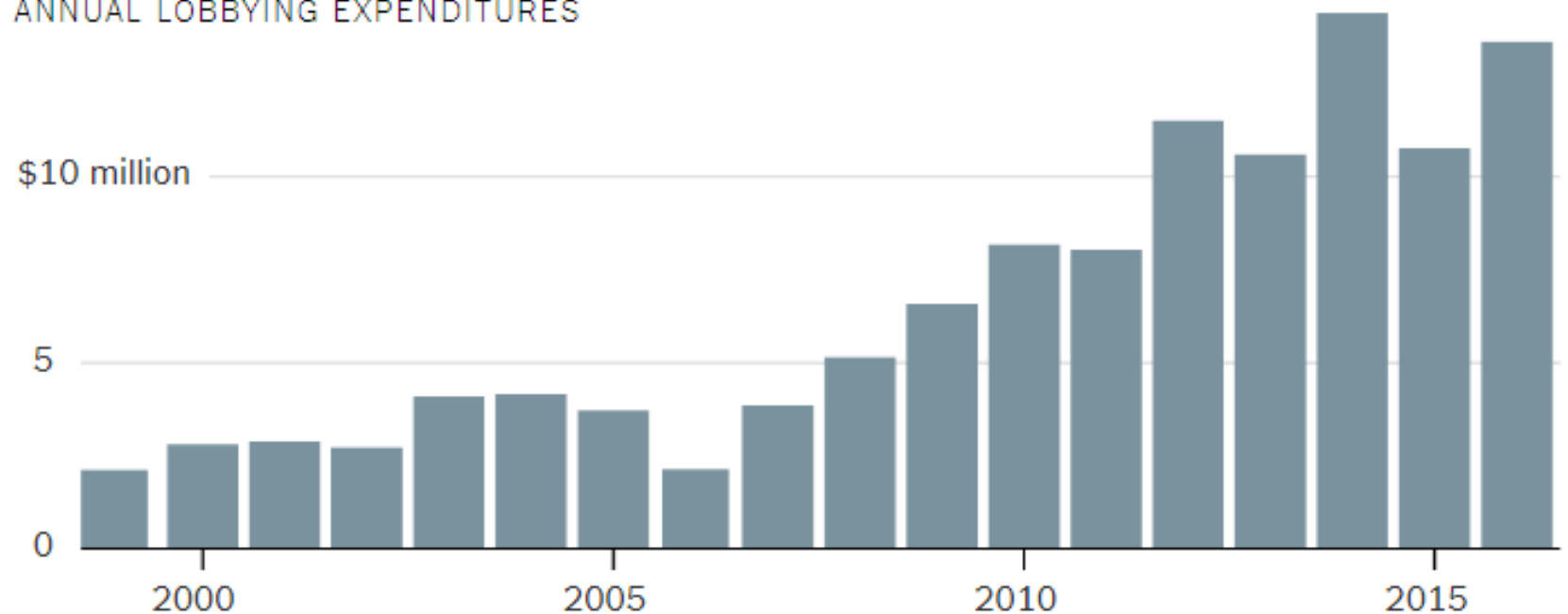


CHEM  HINA syngenta



Lobbying Expenditures by Dow Chemical Have Increased Over Time

ANNUAL LOBBYING EXPENDITURES



Source: Center for Responsive Politics

New York Times, Trump's Legacy: Damaged Brains, Kristof


WE CAN REDUCE EXPOSURE. . .



Environmental Research

Volume 171, April 2019, Pages 568-575

Organic diet intervention significantly reduces urinary pesticide levels in U.S. children and adults

Carly Hyland ^a, Asa Bradman ^a, Roy Gerona ^b, Sharyle Patton ^c, Igor Zakharevich ^b, Robert B. Gunier ^a, Kendra Klein ^d  

This project is possible thanks to the generous members of Friends of the Earth-US as well as grants from foundations, including California Consumer Protection Foundation and Turner Foundation.

Sixteen participants

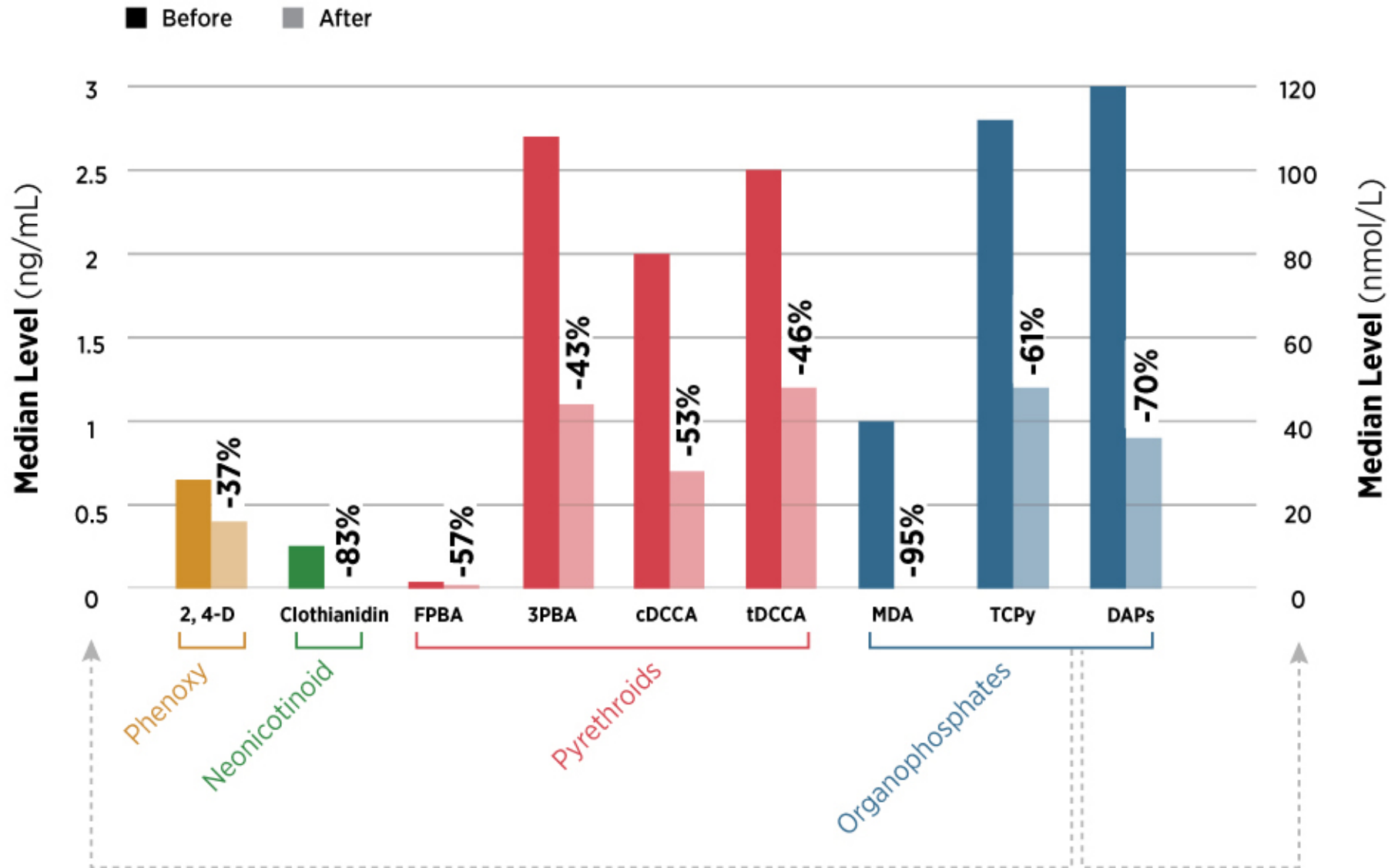


Six day intervention

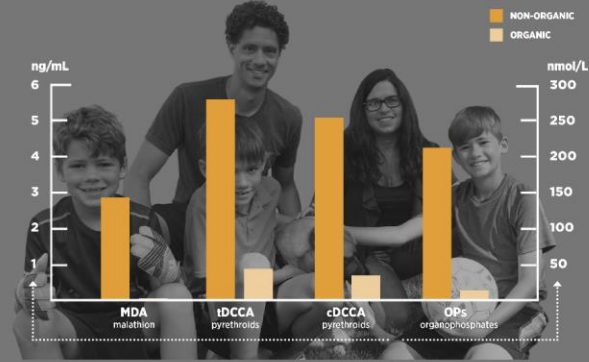
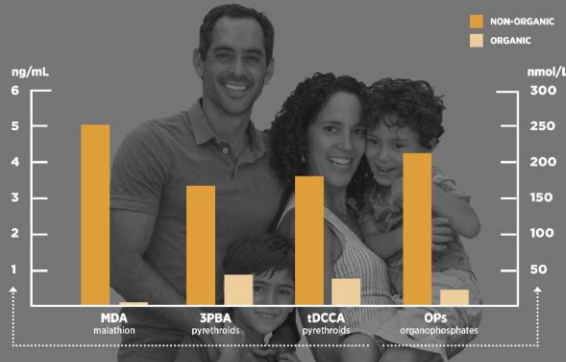
3	4	5	6	7	8	9
Six days conventional diet						
10	11	12	13	14	15	16
Six days organic diet						

Type of pesticide		Analyte	Parent compounds
Organophosphate Insecticides		MDA	Malathion
		TCPY	Chlorpyrifos
	DAPs	DMP	Azinphos-methyl, chlorpyrifos-methyl, dichlorvos, dicrotophos, dimethoate, fenitrothion, fenthion, isazofos-methyl, malathion, methidathion, methyl parathion, naled, oxydemeton-methyl, phosmet, pirimiphos-methyl, temephos, tetrachlorvinphos, trichlorfon
		DMTP	
		DMDTP	
		DEP	Chlorethoxyphos, chlorpyrifos, coumaphos, diazinon, disulfoton, ethion, phorate, sulfotepp, terbufos
		DETP	
		DEDTP	
Pyrethroid Insecticides		3-PBA	Allethrin, cyhalothrin, cypermethrin, deltamethrin, fenpropathrin, permethrin, trialomethrin
		F-PBA	B-cyfluthrin
		cis-DCCA	<i>cis</i> -Cypermethrin, <i>cis</i> -cyfluthrin, <i>cis</i> -permethrin
		trans-DCCA	<i>trans</i> -Cypermethrin, <i>trans</i> -cyfluthrin, <i>trans</i> -permethrin
Neonicotinoid Insecticide		Clothianidin	Clothianidin
Phenoxy Herbicide		2,4-D	2,4-D

Percent decrease in urinary pesticide levels after six-day organic diet intervention



Top four pesticide decreases after one week of organic diet



www.OrganicForAll.org



Over 330,00 views! Please share!

<https://youtu.be/fnQGLJCQBgY>

Organic Diet Intervention Studies

Bradman, A., et al. 2015. **Effect of organic diet intervention on pesticide exposures in young children living in low-income urban and agricultural communities.** *Environmental Health Perspectives*.

Göen, T., Schmidt, L., Lichtensteiger, W., & Schlumpf, M. 2017. **Efficiency control of dietary pesticide intake reduction by human biomonitoring.** *International journal of hygiene and environmental health*.

Lu, C., et al., 2006. **Organic diets significantly lower children's dietary exposure to organophosphorus pesticides.** *Environmental Health Perspectives*.

Oates, L., Cohen, M., Braun, L., Schembri, A., & Taskova, R. 2014. **Reduction in urinary organophosphate pesticide metabolites in adults after a week-long organic diet.** *Environmental Research*.

Organic Diet Comparison Studies

Curl, C.L., R.A. Fenske, and K. Elgethun, **Organophosphorus pesticide exposure of urban and suburban preschool children with organic and conventional diets.** *Environmental Health Perspectives*, 2003. 111(3): p. 377. 2003.

Curl, C. L., Beresford et al. 2015. **Estimating pesticide exposure from dietary intake and organic food choices: the Multi-Ethnic Study of Atherosclerosis (MESA).** *Environmental health perspectives*, 123(5), 475.

Including:
Alcohols
Hydrogen
peroxide
Ozone gas
Calcium
hypochlorite
Soaps
Lime sulfur
Boric acid
Copper
sulfate

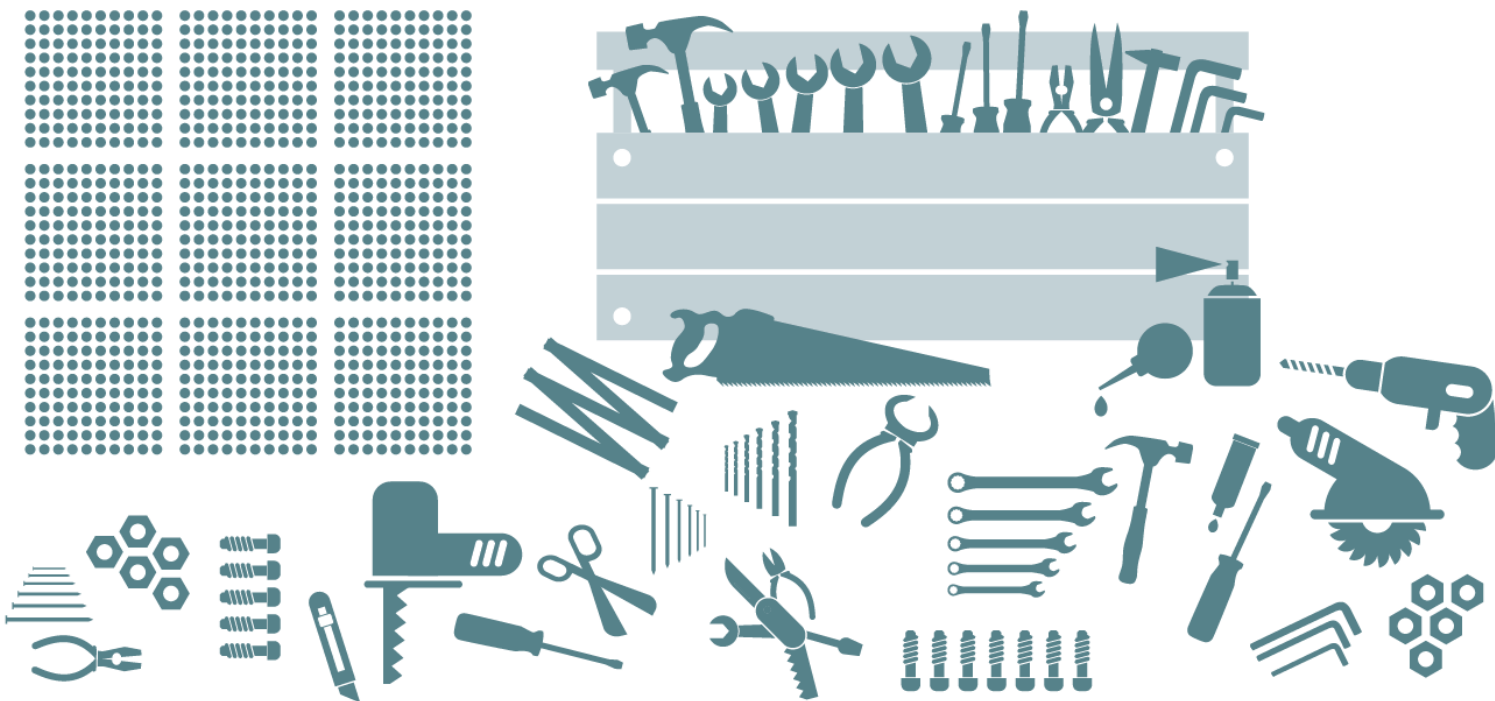
How do the synthetic pest control products allowed in organic farming compare to the pesticides allowed in conventional farming?

25 synthetic active pest control products allowed in organic crop production



The **organic farmer** must first use mechanical, cultural, biological and natural materials and move onto the toolbox only when and if they don't work. In this way the toolbox is "**restricted**."

900+ synthetic active pesticide products registered for use in conventional farming by EPA*



Health benefits associated with an organic diet

Reduced risk of cancer

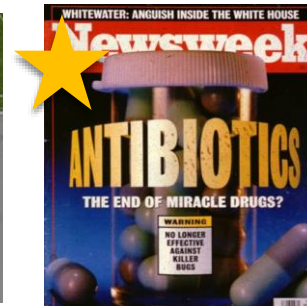
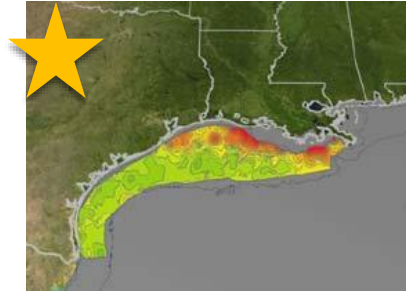
Baudry, J. *et al.*, 2018. Association of frequency of organic food consumption with cancer risk: findings from the NutriNet-Santé prospective cohort study. *JAMA internal medicine*, 178(12), pp.1597-1606.

Improved fertility outcomes

Chiu, Y.H. *et al.*, 2018. Association between pesticide residue intake from consumption of fruits and vegetables and pregnancy outcomes among women undergoing infertility treatment with assisted reproductive technology. *JAMA internal medicine*, 178(1), pp.17-26.

Reduced risk of diabetes

Sun, Y. *et al.*, 2018. Inverse Association between Organic Food Purchase and Diabetes Mellitus in US Adults. *Nutrients*, 10(12), p.1877.





Organic Shmorganic

Conventional fruits and vegetables are perfectly healthy for kids.



Organic food no healthier than non-organic: study



Is organic food worth the higher price? Many experts say no



The Organic Food Movement Is an Insufferably Classist Waste of Money

Spinning Food: How Food Industry Front Groups and Covert Communications are Shaping the Story of Food

<https://foe.org/resources/spinning-food-how-food-industry-front-groups-and-covert-communications-are-shaping-the-story-of-food/>

“Existing US regulations have not kept pace with scientific advances showing that widely used chemicals cause serious health problems at levels previously assumed to be safe.

Our most vulnerable population, our children, face the highest risks.”



Linda Birnbaum, M.S., Ph.D.
Director, National Institutes of
Environmental Health Science

Gross, L. and Birnbaum, L.S., 2017. Regulating toxic chemicals for public and environmental health. *PLoS Biology*, 15(12), p.e2004814.



Environmental Health News

Nov 27, 2018

Chemicals on our food: When “safe” may not really be safe

Scientific scrutiny of pesticide residue in food grows; regulatory protections questioned

Carey Gillam

<https://www.ehn.org/when-safe-may-not-really-be-safe-2621578745.html>

THE SACRAMENTO BEE

I've been a farmworker all my life. Here's why you should buy organic food

BY RUDY ARREDONDO

MARCH 10, 2019 12:01 AM, UPDATED MARCH 07, 2019 12:36 PM



This new study is a powerful reminder that we must – and can – create a healthier food system for all of us. Choosing organic food reduces pesticide exposures in our own bodies and protects the health and well-being of the people who make our food possible: the farmworkers and farmers of America.



“Everyone has the right to clean, organic food.
That is a human right.”

– Tara, Baltimore

WHY IT MATTERS



Your Health

Decades of data shows that



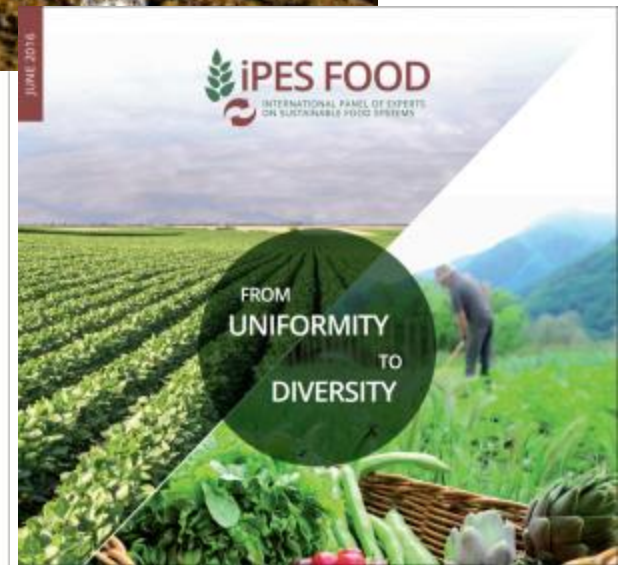
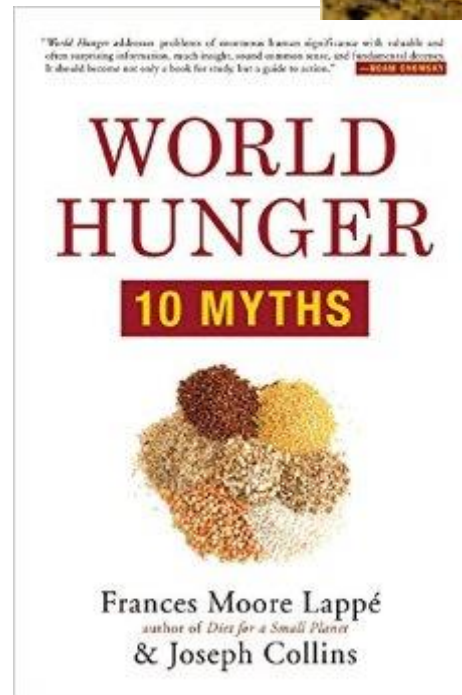
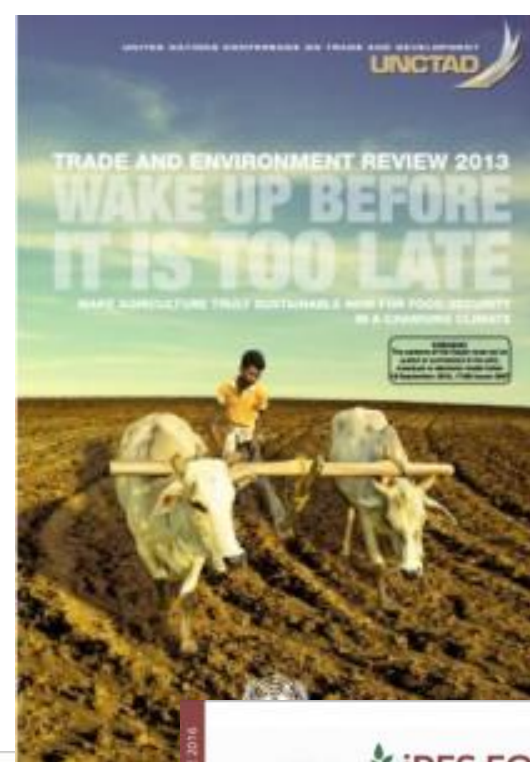
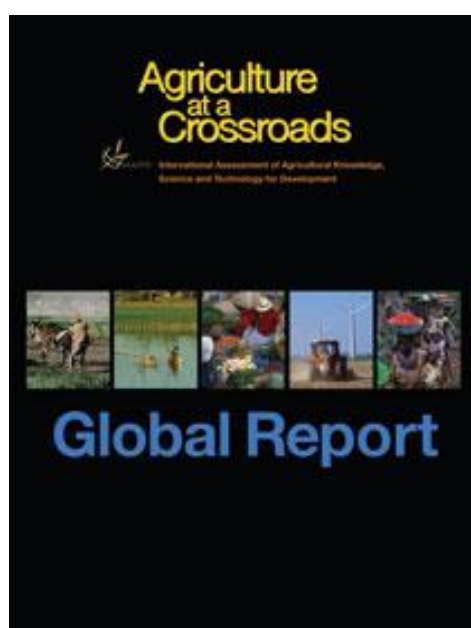
Farmers, Farmworkers and Rural Communities



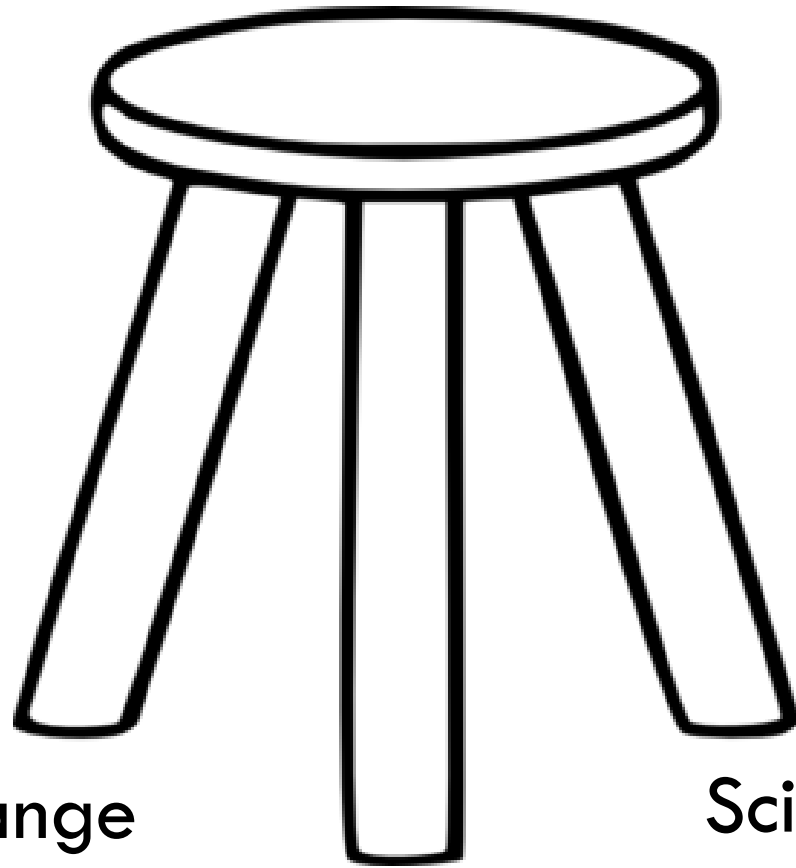
Pollinators and the Environment

www.OrganicForAll.org

**But can organic
“feed the world?”**



Creating a healthy, sustainable food system



Market Change

Science &
Storytelling

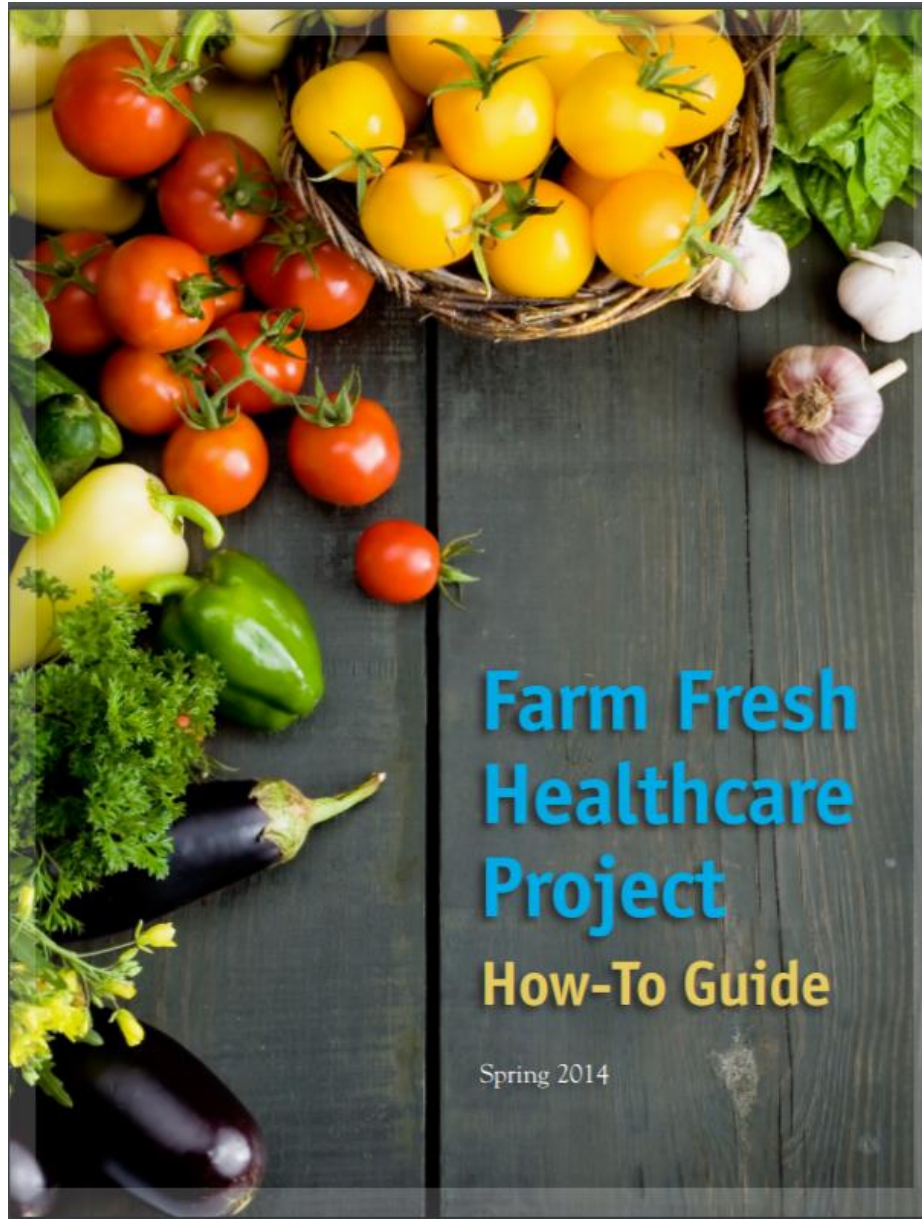
Policy Change



San Francisco General Hospital Signs the HFHC Pledge, 2012. Pictured from left to right are Dr. Michelle Schneiderman, CEO Susan Currin, Dr. Robert Gould, President, Physicians for Social Responsibility, and Shermineh Jafarieh, Director of Diagnostic & Wellness Services

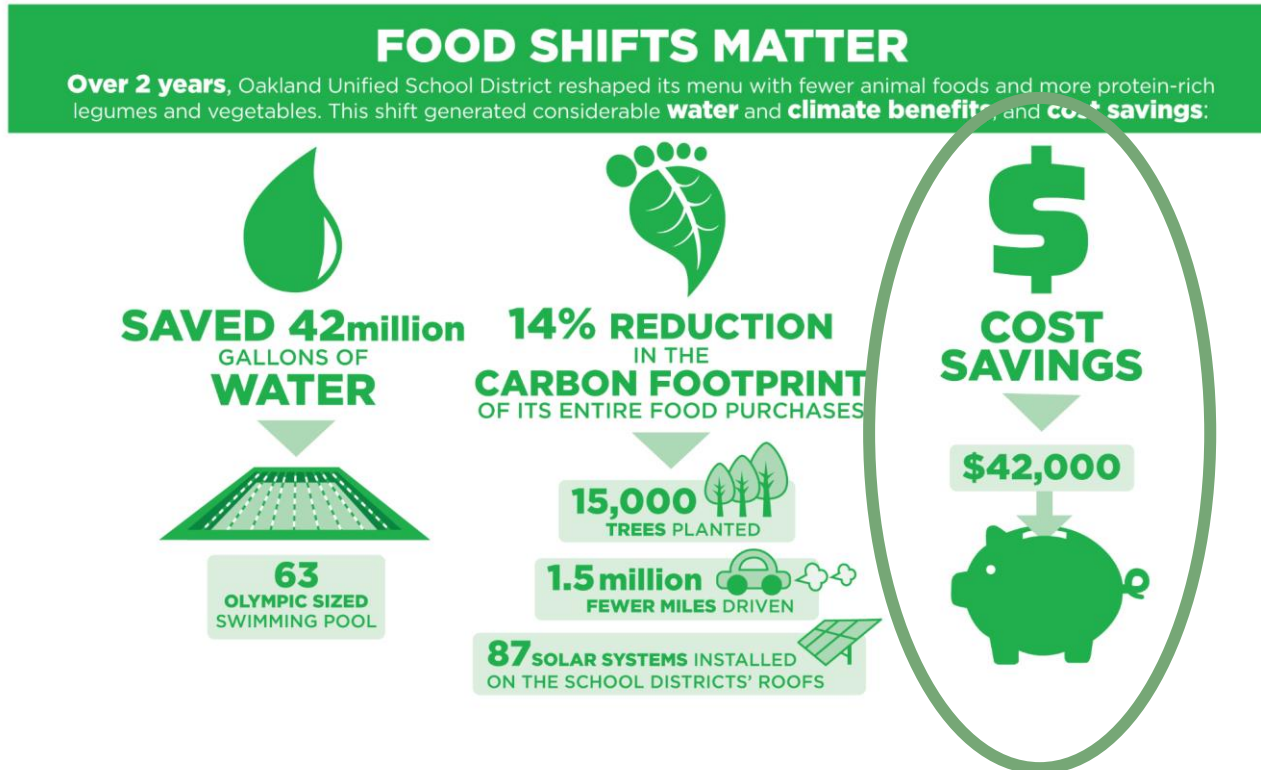
Healthy Food in Health Care Pledge



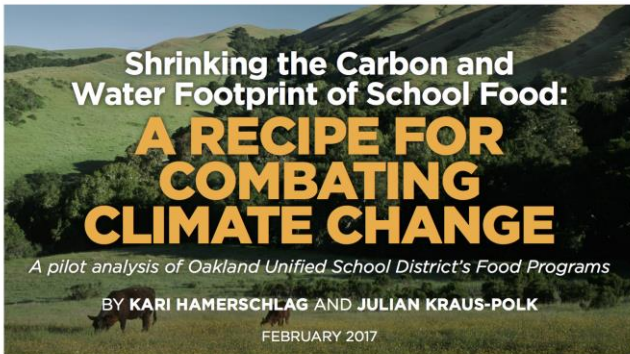


<https://noharm-uscanada.org/documents/farm-fresh-healthcare-project-how-guide>

Increase climate-friendly plant-based options



Results of Oakland Unified Pilot Study



Scaling Up Healthy, Climate-Friendly School Food

STRATEGIES FOR SUCCESS



<https://foe.org/issues/food-and-technology/>

Home / News Releases / Costco releases new policy to limit toxic pesticides to protect pollinators

Costco releases new policy to limit toxic pesticides to protect pollinators

June 14, 2018

Company also increasing pollinator and people-friendly organic offerings

- Publicly disclose progress towards these goals

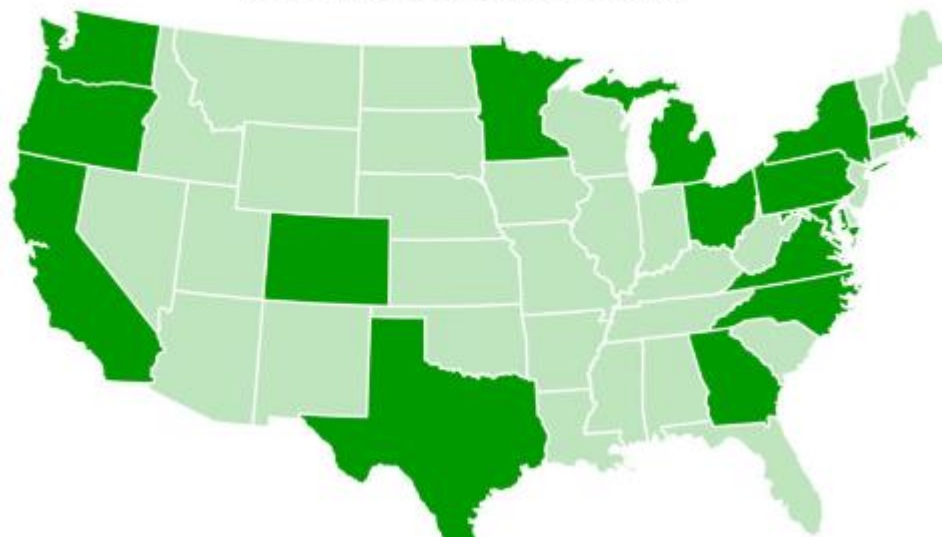
We shopped at the top four food retailers in the U.S.



for their house brands



in 15 states across the country



GLYPHOSATE

30 oat cereal samples tested



100%

had residues with an average of **360 ppb**

27 pinto bean samples tested



100%

had residues with an average of **509 ppb**

NEONICOTINOIDS

22 applesauce samples tested



73%

had residues with an average of **0.037 nmol/g**

25 spinach samples tested



80%

had residues with an average of **0.065 nmol/g**

ORGANOPHOSPHATES

22 applesauce samples tested



100%

28 apple samples tested



61%

25 spinach samples tested



32%

State Policy Advocacy



Opinion: Eliminating the Pesticides Inside Us

Devon Payne-Sturges March 5, 2019



A bill has been introduced in the Maryland General Assembly to ban chlorpyrifos in our state. Several other states are also moving in this direction.

Policymakers should closely review this study – and all of the evidence on chlorpyrifos – and act in the public interest to ban this dangerous chemical.

More than 300 Groups Urge Congress to Make Food and Agriculture Central to the Climate Crisis and Green New Deal Debate

<https://bit.ly/2Gdt57F>



CHLORPYRIFOS

WINS!

- Consumer use banned in the U.S. since 2000
- Hawaii ban in 2018
- California & New York bans in 2019

ONGOING EFFORTS

- State ban bills MD, OR, CT, NJ
- National Ban Toxic Pesticides Act in House has over 100 co-sponsors
- National Protect Children, Farmers and Farmworkers from Nerve Agent Pesticides Act in Senate has 12 co-sponsors



GLYPHOSATE

WINS!

- Banned or restricted in hundreds of locations worldwide ([full list](#))
- Restricted in France & Germany

ONGOING EFFORTS

National Keep Food Safe from Glyphosate Act

- Require USDA to annually test for food residues
- Ban the practice of spraying glyphosate as a pre-harvest drying agent
- Require EPA to restore 0.1 ppm food tolerance for residues



NEONICOTINOIDS

WINS!

- Banned for outdoor agricultural use in EU
- Consumer use banned in MD, CT, and VT
- Restricted by over 115 U.S. cities and universities

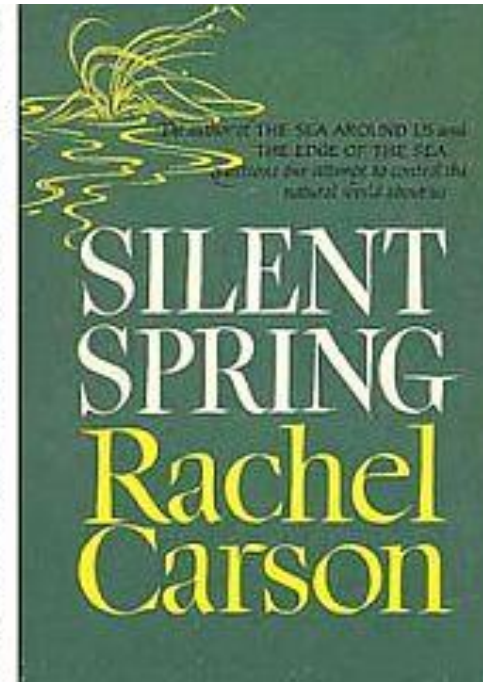
ONGOING EFFORTS

- State bills in NY, NJ, MA
- National Saving America's Pollinator Act
- National Protect our Refuges Act



“Man is a part of nature,
and his war against
nature is inevitably a
war against himself.”

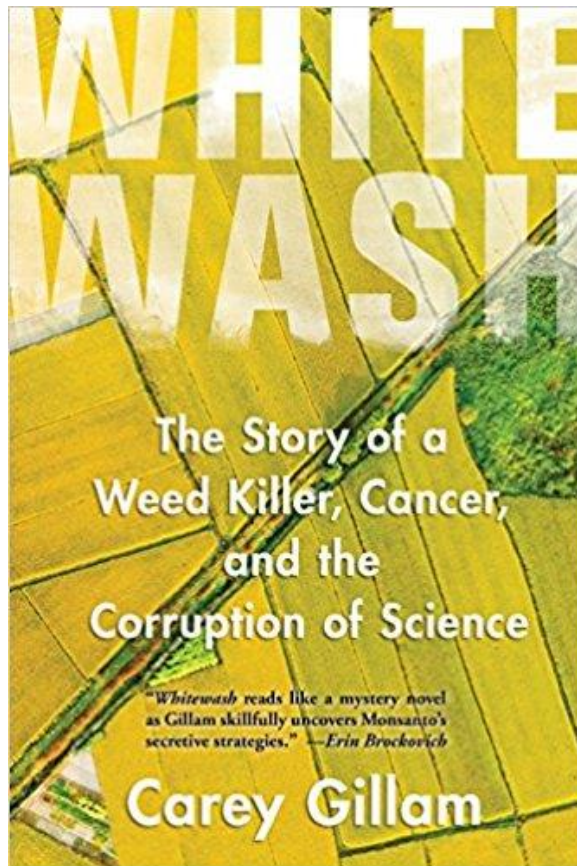
- Rachel Carson, 1962





Ana Mendieta, *Earth Body*, 1972

“. . .we participate with our bodies in a metabolic process and can be eroded like the stones and trees.”
(Beck, *Risk Society*, 1992, p. 74).



**Californians for
Pesticide Reform**



**BEYOND
PESTICIDES**



Inventory of Farm Worker Issues and Protections in the United States

Bon Appetit Management Co, United Farm Workers. March 2011.

Exposed and Ignored: How Pesticides are Endangering our Nation's Farmworkers, Farmworker Justice, 2013

THANK YOU!

Kendra Klein, PhD, Senior Staff Scientist, Friends of the Earth

Kklein@foe.org

[@KendraCKlein](#)

