



Pesticides & GMOs

a review of the science

YREA presents food for thought on the impact of pesticides & GMOs on human health & the environment & justification for support of organic agriculture & diet

York Region Environmental Alliance – yrea.org
raising awareness of toxic substances since 2002



Impact on human health



- Linked to cancer, Parkinson's, ADHD, Alzheimer's, sterility, autism, genetic changes, nerve & mood disorders.
- Endocrine disruptors – interfere with hormones & hormone balance.
- Can cause diabetes, thyroid tumors, early puberty.
- Decreases nutritional value of foods.

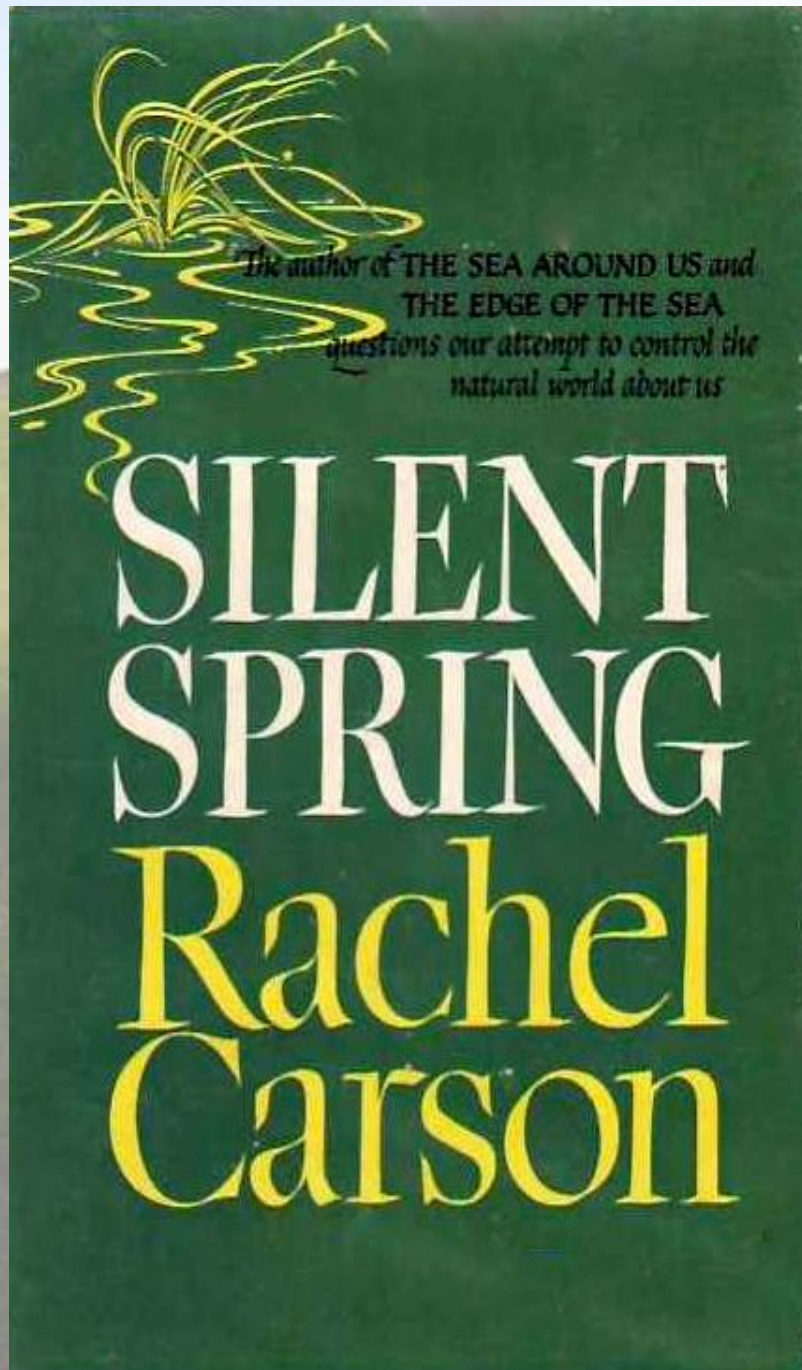
Source: Pesticide Action Network North America



Impact on the environment

- Contaminates soil, water & air through leaching & drift.
- Destroys beneficial soil organisms.
- Blamed for drastic decrease in bees & other pollinators.
- Compromises animal health.
- Reduces biodiversity.





How it evolved after WW2

- DDT, a chlorinated hydrocarbon first formulated to treat lice & malaria taken up for agriculture.
- Diazinon replaced DDT, but soon found to be as toxic.
- Malathion, an organophosphate, used in agriculture & mosquito control since the 1950s.
- After Rachel Carson's 1962 book ***Silent Spring***, skeptics began to question the benefits & health implications of many chemicals.



A breakdown of a few

- Glyphosate/Roundup - Monsanto/Bayer
- Atrazine – Syngenta
- Dicamba – DuPont/BASF & Monsanto/Bayer
- Chlorpyrifos – DuPont/Dow Chemical
- Neonicotinoid family
 - Imidacloprid – Bayer CropScience
 - Thiamethoxam – Syngenta
 - Clothianidin – Bayer/ Sumitomo
 - Thiacioprid – Bayer CropScience
 - And a few more





Glyphosate/Roundup

- A synthetic herbicide widely used in agriculture, forestry, industrial sites, groundskeeping & aquatic environments.
- Routes of exposure: Inhalation, skin contact, ingestion.
- Occupational exposures: 38,000 - 56,000 Canadian agricultural workers are exposed to glyphosate annually.
- Environmental exposures: Via diet, domestic & farm applications. Interferes with many metabolic processes in plants, animals & humans. Residues have been found in all three.
- Glyphosate/Roundup is the most widely sold & applied pesticide in Canada (+50,000,000kg/yr.)

Source: Carex Canada & Ecojustice



Glyphosate development

- Glyphosate first used as a descaling & chelating agent to remove minerals such as calcium & magnesium in industry i.e. chimney & pipe scrubbers.
- Patented as the herbicide Roundup & as an antibiotic.
- Roundup Ready crops - corn, soy, canola, cotton, sugarbeets, alfalfa genetically engineered (GE), DNA altered to resist glyphosate damage.
- LOBBYING? YOU BET - In 1985 EPA classified glyphosate as a class C carcinogen then changed classification in 1991 to class E - evidence of non-carcinogenicity for humans - during the time Monsanto developed GM crops.



Roundup & human health

- An endocrine-disruptor (as are many herbicides) it damages DNA, drives mutations that lead to cancer.
- Celiac disease, gluten intolerance, disruption of gut bacteria leading to Leaky Gut Syndrome.
- Nutritional deficiencies in the diet, especially minerals & essential amino-acids. Remember the chelating use?
- Causes antibiotic resistance.

*Source: GLYPHOSATE: DESTRUCTOR OF HUMAN HEALTH & BIOCIVERSITY
compiled by Dr. Rosemary Barton from a global network of independent scientists*



Dewayne Johnson, first cancer victim who sued Monsanto

\$10.9 billion in damage settlements to
100,000+ Roundup cancer plaintiffs.

Monsanto now argues that if EPA doesn't
require a cancer warning label, they cannot
be held liable for failing to warn consumers
about cancer risks.

Source: Bill Jeffery, The Conversation, Sept. 2026

Ongoing class-action lawsuits representing
people with Parkinson's disease due to
exposure to paraquat herbicide used heavily
in grain farming, orchards, vineyards &
vegetables.

Source: Ontario Farmer

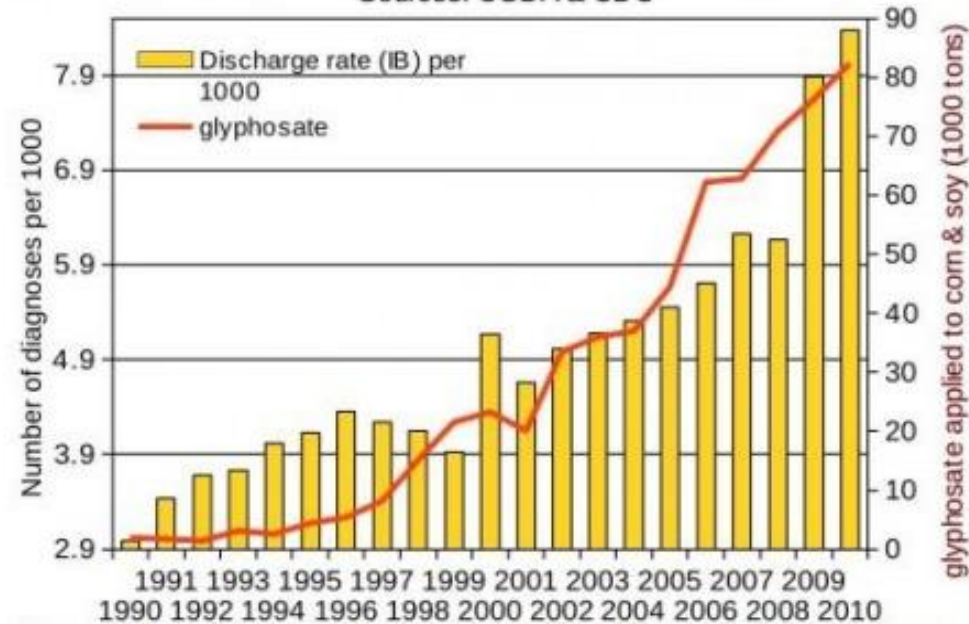




Glyphosate increase use & rise in many diseases

Hospital discharge diagnoses (any) of Inflammatory Bowel disease
(Crohn's and Ulcerative Colitis ICD 555 & 556)

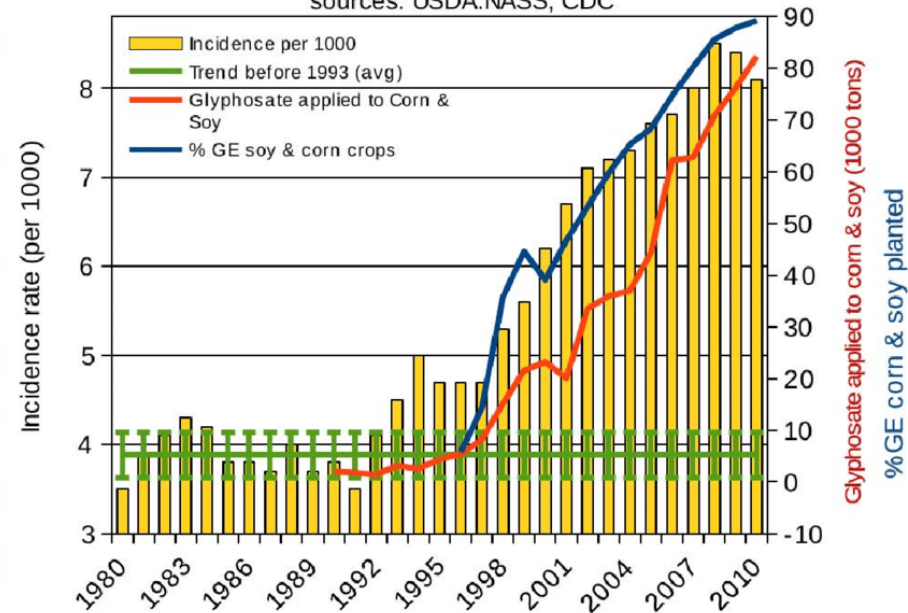
plotted against glyphosate applied to corn & soy ($R = 0.9378$, $p \leq 7.068e-08$)
Sources: USDA & CDC



Irritable bowel syndrome

Annual Incidence of Diabetes (age adjusted)

plotted against %GE corn & soy crops planted ($R = 0.9547$, $p \leq 1.978e-06$)
along with glyphosate applied to corn & soy in US ($R = 0.935$, $p \leq 8.303e-08$)
sources: USDA:NASS; CDC

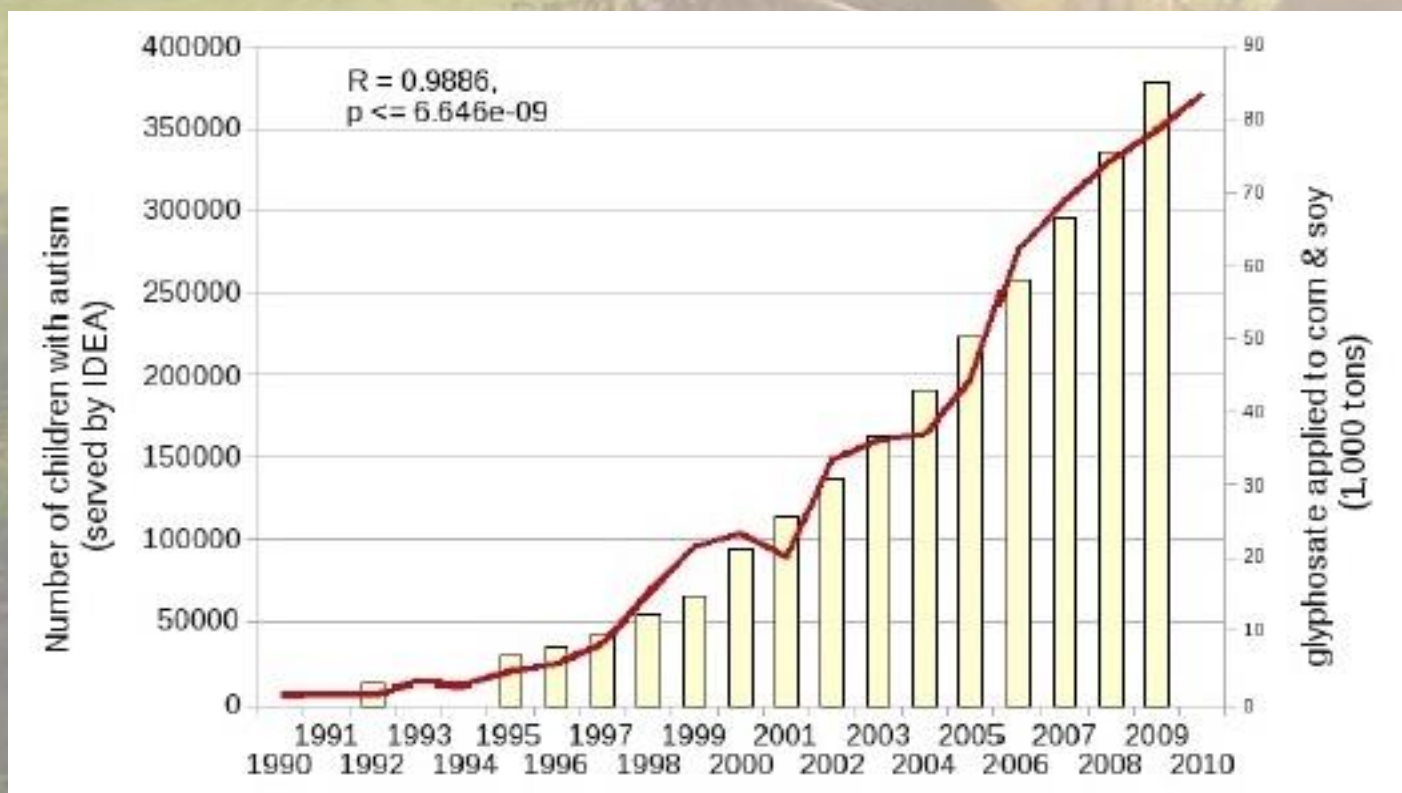


Diabetes



Autism in children

Direct relationship between the increased use of glyphosate & rise in autism in children



Source: GLYPHOSATE: DESTRUCTOR OF HUMAN HEALTH & BIODIVERSITY
compiled by Dr. Rosemary Mason



Vaccine/autism connection

Anthony Samsel & Stephanie Seneff MIT

- Monsanto admits that glyphosate residue accumulates in the bones, marrow & ligaments of animals.
- Measles virus for MMR is grown on gelatin made from the bones & ligaments of commercially raised animals that have been fed a steady diet of Roundup Ready corn & soy.
- Research scientist Dr. Anthony Samsel confirmed that gelatin is the source of glyphosate contamination in vaccines.
- All vaccines listing gelatin & bovine serum as ingredients tested positive for glyphosate, while those that contained neither of these ingredients tested negative.
- Priorix MMR vaccine, available in Canada, does not contain gelatin.
- Look for supplements in vegetable rather than gelatin capsules.



It's not gluten intolerance, it's glyphosate intolerance

- Celiac disease associated with imbalances in gut bacteria just like the known effects of glyphosate on gut bacteria.
- Celiac disease associated with impairment of enzymes. Glyphosate inhibits enzymes.
- Deficiencies in iron, cobalt, molybdenum, copper & other metals associated with celiac disease can be attributed to glyphosate's strong ability to chelate these elements.
- Deficiencies in tryptophan, tyrosine & other amino acids associated with celiac disease match glyphosate's known depletion of these.
- Celiac disease patients have a known increased risk for non-Hodgkin's lymphoma, which has been implicated in glyphosate exposure.

Source: Research Gate, Anthony Samsel & Stephanie Seneff MIT



The proof -



Italy banned pre-harvest spray of wheat with glyphosate in 2016 and set MRL (maximum residue levels at 10pp billion while Canada continues to allow 5pp million - **500 times more** - even as it considered raising those levels upon industry request.

People suffering from IBS in Canada do not have these problems eating bread or pasta in Italy or pasta imports from Italy.



Organic breads do not contain glyphosate residues



Use organic flour for home baking



Atrazine



- Atrazine used extensively in Canada as a pre- and post-emergent weed killer, primarily for corn, canola & vegetation control in cropland and industrial areas.
- It is one of the most frequently detected pesticides in surface, ground & well water right across Canada. Atrazine contamination has been found in drinking water in Toronto & Montreal.
- It is an endocrine disruptor causing hormonal imbalances connected to hermaphrodite frogs, feminized fish, low sperm counts & birth defects in humans.
- Atrazine is classified as possibly carcinogenic to humans.
- It has been banned in the EU since 2007.

Source: Government of Canada



Dicamba



- Heavy use of pesticides have given us superweeds resistant to Roundup.
- Deadlier formulations of weed killers & GMO seeds (Xtend) using dicamba reach market to try to combat.
- Dicamba drift to non GMO crops and organic fields has damaged fruits, vegetables & orchards.
- A systemic herbicide working up through a plant's roots, stems, leaves & fruit.



Chlorpyrifos

- Linked to brain damage & low IQ in children.
- Most often used for wheat, corn, almonds, grapes & fruit trees including oranges, bananas & apples.
- EU bans brain harming pesticide – Dow Chemical (now Corteva) phased toxin out in 2020 because of drop in sales.
- Still used in Canada for:
 - Outdoor standing water – for larval & adult mosquito control
 - Greenhouse ornamentals
 - Japanese Beetle

Source: Government of Canada



How much damage needs to be done before toxic substances are banned?



Through Bill C-30 the federal government is weakening pesticide regulations by eschewing science based decision making, thereby increasing the use of toxic pesticides in the name of economic & food security. This will allow a further erosion of the environment, human health and species at risk.



The American landscape has become **48 times more toxic** to insects since the 1990s. **Neonics** are largely to blame.



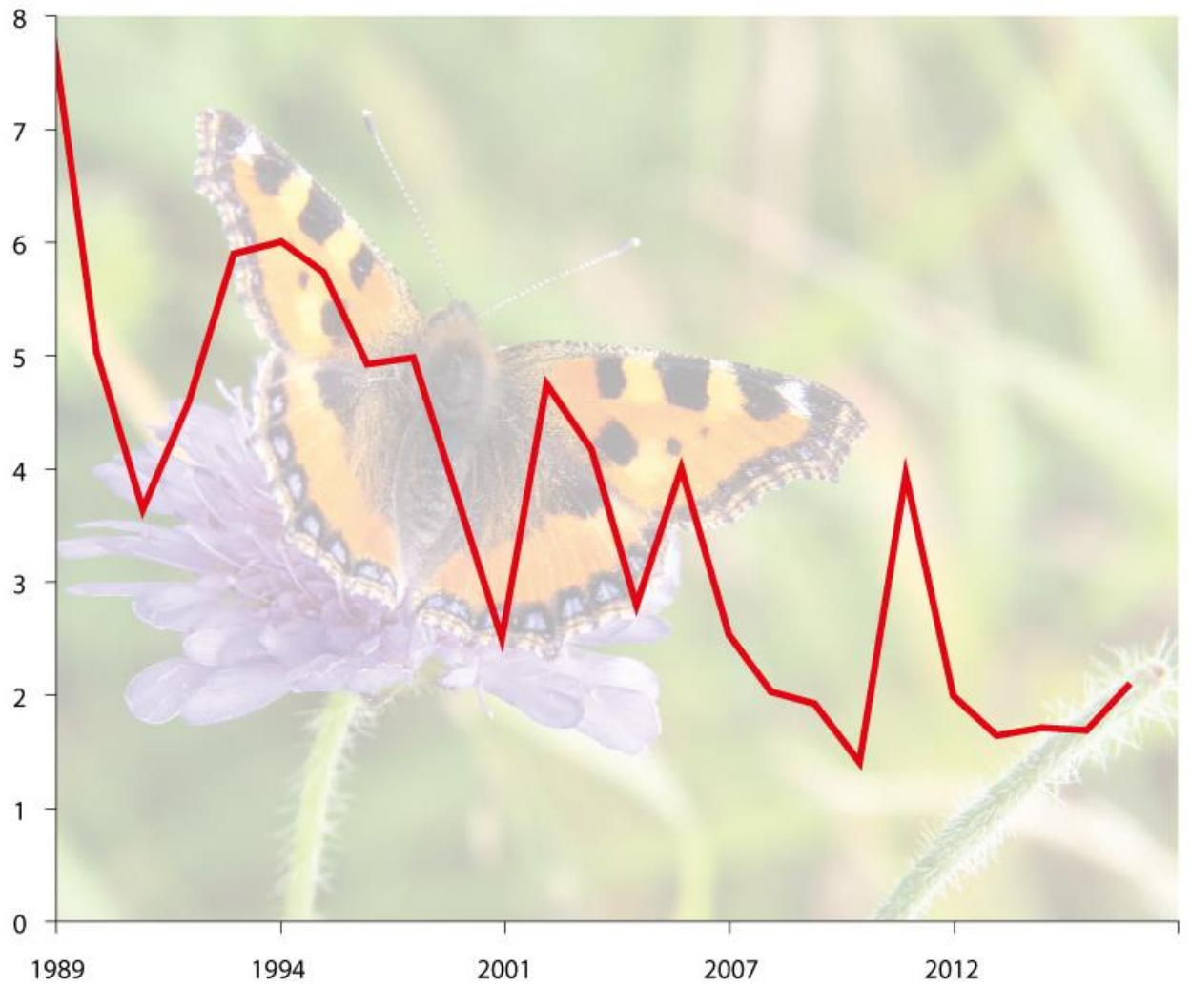


Neonicotinoids

- Corn, alfalfa, canola, soybean, cotton, wheat & ornamental 'bee friendly' perennial seeds are coated with neonic insecticides.
- Systemic insecticide is absorbed by plants through roots, leaves, flowers & fruit.
- Ingested by insects via pollen, nectar.
- Indirectly harm crops they are supposed to protect by killing insects that boost yields through consumption of pests.
- Residual in fields; soluble, mobile, running off into waterways well beyond farms.



Flying insect abundance has fallen by 75% since 1989



Insecticides kill not only harmful insects but also beneficial ones & reduce amount of available food for birds & mammals

Source: *Future Timeline.net*



Neonics

- Pollinators have declined drastically in the last 20 years. Causes include: climate change, habitat loss, air pollution, parasites, artificial night lighting, monocultural crops.
- BUT MOST OF ALL – increased use of neonic pesticides.
- Widespread use of neonics is putting global food production at risk.
- 86% of honey sampled in North America contained neonics & a cocktail of other pesticides.
- EU banned 3 neonicotinoids in 2018 but leaves loopholes for continued use.
- Canada, influenced by Monsanto/Bayer reverses ban on neonics.
- Cornell U has evidence that use of neonics does not lead to yield or income increases for farmers, evidence that runs contrary to industry claims.

Source: Beyond Pesticides

Neonic use & honey decline



Source: Duke University



Big Chem & GMO, pesticide lobbyists

- Hired ghost writers & scientists to publish favourable studies defending Roundup
- Continue to lobby against GMO labelling
- Continue to lobby to cut regulations & speed up approvals of GMOs & pesticides
- Pressure governments to approve their products
- Greenwashing GMO label approved for use in the USA - was spotted on GE corn being sold at Whole Foods
- Incessantly attack & try to discredit independent scientists, journalists & critics who speak out against GMOs & pesticides
- Alleged to offer bribes for approval of their products





Canadian GMO whistleblowers



Thierry Vrain, geneticist with Health Canada for 30 years, relentlessly maligned by chemical industry for speaking out against GMOs & glyphosate/Roundup



Shiv Chopra, microbiologist, raised awareness of harm of growth hormones, antibiotics, GMOs, pesticides & the collusion of agencies & pesticide industry



NEW STUDY

ADOLESCENT DEPRESSION LINKED TO LEAKY GUT

Increased intestinal permeability may promote the development of depression
Severity of depression associated with level of intestinal permeability



FACT
Insecticide producing GMO Bt toxic corn is linked to leaky gut in animal feeding studies

FACT
Glyphosate-based herbicides may kill good gut bacteria and contribute to microbiome imbalances that can lead to leaky gut

HEAL THE GUT, HEAL THE MIND

BOYCOTT GMOs AND GLYPHOSATE DESICCATED CROPS

GMO FREE USA GMO FREE CANADA

Dr. Thierry Vrain raised awareness of the glyphosate/gut/brain connection & was outspoken of the dangers of this herbicide

rBGH = GMOs in US DAIRY

Although banned in most industrialized nations due to health risks to humans & harm to animals, genetically engineered recombinant bovine growth hormone (rBGH) is injected into dairy cows in the US to increase milk production. Some serious concerns include:

- ☐ Increased many health problems in cows, including mastitis that can lead to bacteria and pus in milk (requiring antibiotics). Impinged on the welfare of animals; caused reproductive disorders (EU Report)
- ☐ Antibiotic use in food animals can lead to antibiotic resistance in humans
- ☐ Linked to various forms of cancer – breast, prostate, lung and to tumor development (Cancer Society)
- ☐ Precocious puberty

[Look for the Canadian Milk symbols](#)

BUY CANADIAN DAIRY, SUPPORT OUR OWN FARMERS & SAFEGUARD ANIMAL & HUMAN HEALTH

Dr. Shiv Chopra saved Canadians from bovine growth hormone
at the expense of his career



The connection between human & soil health

- Our health is in large part determined by the health of the soil in which our food is grown through the nutrients or toxins taken up by plants & animals that eat the plants which we, in turn consume.
- The human body must get alkaloids & essential amino acids from plant foods that feed off bacteria in soil.
- Glyphosate kills off beneficial microbes & bacteria in soil, affecting human gut microbiome & causing antibiotic resistance.

Food ingredient awareness

RESIDUES OF **65** DIFFERENT PESTICIDES DETECTED IN **RAISINS**

according to new USDA pesticide data report on testing of 756 raisin samples



MOST WIDELY FOUND PESTICIDES: % OF SAMPLES CONTAMINATED

Fluopyram	50.3%
Trifloxystrobin	60.7%
Tebuconazole	61.8%
Myclobutanil	64.0%
Pyraclostrobin	65.3%
Spirotetramat	70.6%
Quinoxifen	74.3%
Bifenthrin	76.9%
Boscalid	82.3%
Imidacloprid	83.9%
Methoxyfenozide	87.2%

**DON'T TAKE THE RISK
BUY ORGANIC**



You can see by the list of pesticides found in raisins that we are only discussing a few



Show of hands - Who's frosted with Roundup Ready GMO Sugar?



BOYCOTT Kellogg's

There's no sugar-coating it: Twenty-five percent of Americans have non-alcoholic fatty liver disease (NAFLD), which can lead to cirrhosis of the liver. A peer-reviewed study found that Roundup causes NAFLD at very low doses. Kellogg's frosted cereals are coated with sugar from GMO sugarbeets sprayed with Roundup.



Better cereal choices





RESTAURANT FOOD TESTING RESULTS ARE IN!

GLYPHOSATE RESIDUE IN PIZZA:

PAPA JOHN'S
DOMINO'S
PIZZA HUT

213 ppb
60 ppb
9 ppb





What can we do?

**THE FIRST TIME THE PESTICIDES ARE
WASHED OFF THE TEA LEAVES IS WHEN
YOU STEEP THEM IN YOUR CUP**



BUY ORGANIC.



Avoid the worst

The Dirty Dozen



apples



celery



strawberries



peaches



spinach



nectarines-
imported



grapes-
imported



sweet bell
peppers



potatoes



Blueberries-
domestic



lettuce



kale/collard
greens

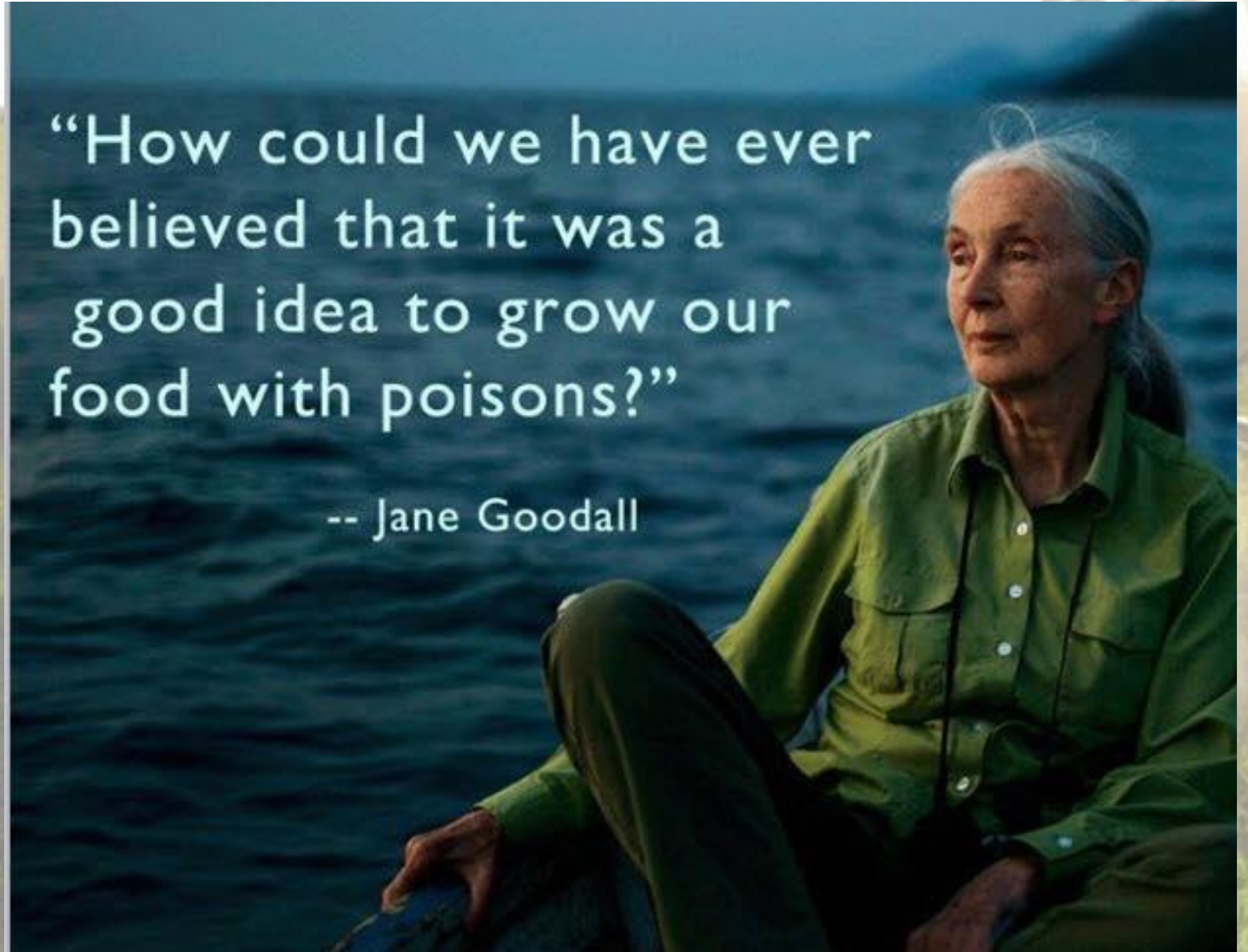
The dirty dozen are the foods with the highest amount of pesticide use. YREA does not endorse the 'clean 15' list because it includes GM foods and onions which are irradiated to prevent sprouting. This is not permitted with organic.



Think about this...

“How could we have ever believed that it was a good idea to grow our food with poisons?”

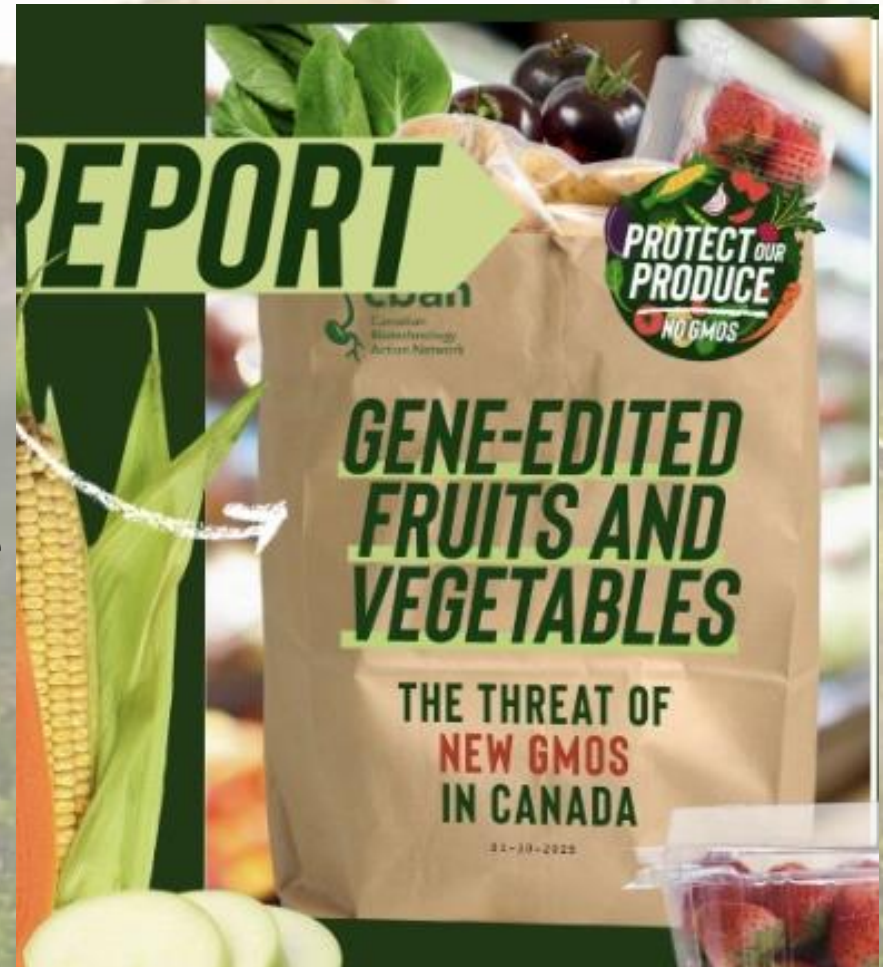
-- Jane Goodall





What is done to foods to alter them genetically

- DNA traits have been engineered in plants to resist pests & herbicides.
- Bt corn, potato, sugar beet, cotton, eggplant, tomato, rice & soybean are engineered to produce the same toxin as the bacterium *Bacillus thuringiensis* in the plant cell.
- Roundup Ready crops are engineered to withstand the spraying of glyphosate & include corn, canola, soybean, cotton, sugar beet & alfalfa.
- Viruses have been incorporated into the DNA of sweet potato, papaya & zucchini to make them resistant to viral diseases.
- GMO crops on the market in Canada – alfalfa, canola, corn, cotton, papaya, pineapple, soy, sugar beet, tomato.



Source: CBAN, Canadian Biotechnology Action Network



WHICH FOODS ARE LIKELY SPRAYED DIRECTLY WITH ROUNDUP/GLYPHOSATE?

(a genotoxic, probable human carcinogen that kills good gut bacteria)

GMO CROPS

CORN
SOY
CANOLA
SUGAR (BEETS)
COTTON(SEED OIL)
ALFALFA
SUGAR CANE
(grown in Brazil, approved in U.S.)



CONVENTIONAL NON-GMO CROPS

OATS
WHEAT AND
OTHER GRAINS
PEAS
BEANS
LENTILS
SUGAR CANE

**AVOID OR BUY
ORGANIC OR BIODYNAMIC TO
MINIMIZE YOUR EXPOSURE**



Not just on GMO crops



- Roundup used as a desiccant just before harvest of many crops that humans & animals consume such as cereals, grains & legumes, leaving pesticide residues.
- Italy has reduced import of Canadian wheat by 80% due to health concerns regarding pesticide residue.
- A huge public outcry has resulted in a Health Canada pesticide review after considering request by Bayer to increase maximum residue limits (MRL).



Antibiotic & hormone free



Pasture fed is best but can often be 'finished' with corn/soy feed. Ask your farmer

Detox

We can speed the detox of pesticides from our bodies with some of these foods:

- TEAS - tarragon, stinging nettle, oregano, green tea
- Dandelion - tea or salad greens picked from your pesticide free lawn
- Turmeric tea & spice
- Cilantro fresh herb

All organic of course





Best choice is to eat organic



Image: Courtesy of Friends of the Earth Canada



‘But it’s more expensive’

Yes, but you ARE worth it

product	conventional	organic
mushrooms	\$3.49 lb	\$3.99 lb
onions	\$5.99 3lb bag	\$5.99 3lb bag
apples	\$9.50 3lb bag	\$9.75 3lb bag
black beans	\$1.99 19 oz	\$2.00 14 oz
fresh cilantro	\$1.99 pkg	\$2.99 pkg
potatoes	\$5.99 3lb bag	\$6.99 3lb bag
artisanal bread	\$4.49 loaf	\$5.99 loaf
green kale	\$2.99 bunch	\$3.79 bunch
broccoli	\$4.99 bunch	\$4.99 bunch
carrots	\$3.99 bunch	\$4.99 bunch
chicken thighs boneless	\$13.49 lb.	\$15.49 lb.
eggs, large brown	\$4.29 dozen	\$7.99 dozen
difference \$12.26	\$62.69	\$74.95



Save money elsewhere

- A few less lattes
- One less bottle of wine a week
- Buy used clothes
- Keep clothes longer
- If Jane Fonda can do it, so can we - wears 6 yr old dress to academy awards





Use less meat



Cook more Asian or Mediterranean (1 lb ground meat serves 8 in moussaka) or use lentils



And the good news IS studies have shown...



Source: Dr. Liza Oates University of Australia, Environmental Research

So even if you eat out where food is not pesticide free, you can eliminate toxins quickly by keeping your home diet organic



Photo by Denise Miltzer at Joyfully Organic Farm

By supporting local organic...

- You will be supporting the health of our air, soil, water & farmworkers & the health of your family.
- You will be reducing the agricultural carbon footprint of distant transportation of food by 14%.
- You will drive demand so more farmers convert to organic.



Sources & further reading

TAKE ACTION - MAKE THE SWITCH TO ORGANIC!

YREA has touched on the tip of the iceberg. Google to learn more -

CBAN - Canadian Biotechnology Action Network;

FOOD DEMOCRACY NOW & DETOX PROJECT, glyphosate unsafe on any plate;

GLOBALRESEARCH.CA/right to healthy food : poisoned by pesticides;

GLYPHOSATE: DESTRUCTOR OF HUMAN HEALTH & BIODIVERSITY, Dr. Rosemary Mason;

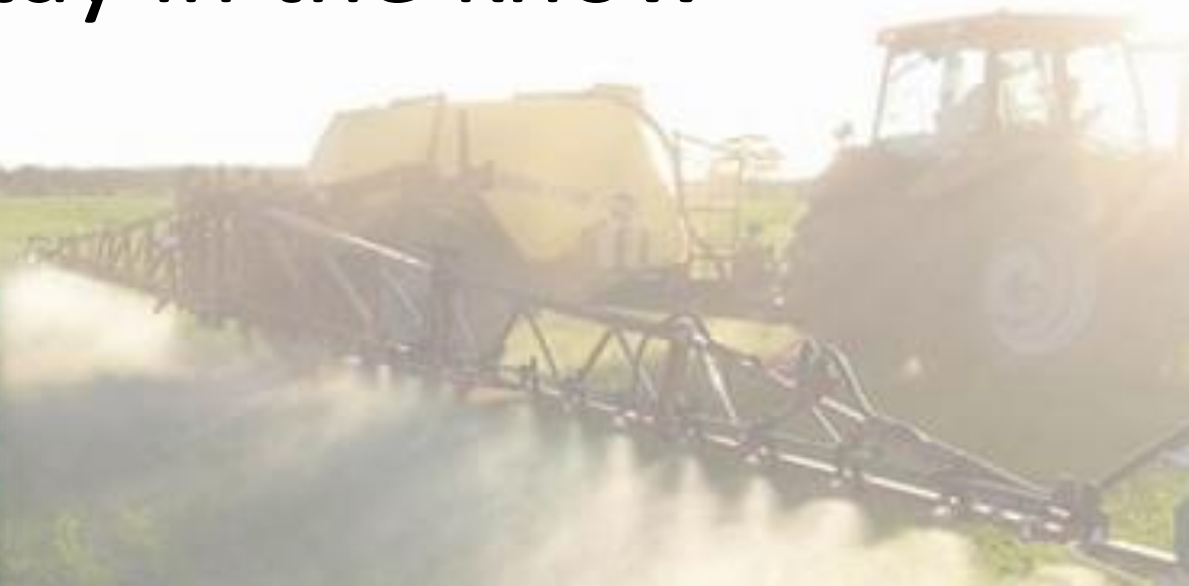
GM WATCH; GMO MYTHS & TRUTHS earth science open source;

GMO FREE CANADA/GMO FREE USA; PESTICIDE ACTION NETWORK, panna.com;

SUSTAINABLE PULSE; WEEDKILLER CRISIS; WIKIPEDIA/DICAMBA;



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