

## Diseases Increasing in Incidence (Epidemic)

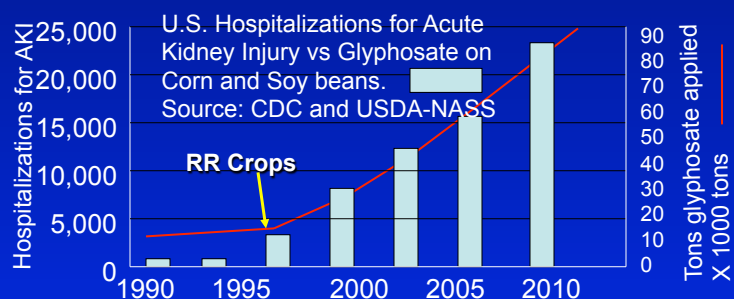
(after Fox, 2012; Antoniou et al., 2012, Samsel & Seneff, 2013; Swanson, 2013)

<i>Allergies, Asthma</i>	<i>Diabetes</i>
<i>Alzheimer's</i>	<i>Difficile diarrhea</i>
<i>Arthritis</i>	<i>Gluten intolerance</i>
<i>Atopic dermatitis</i>	<i>Indigestion</i>
<i>Autism</i>	<i>Infertility</i>
<i>Autoimmune diseases</i>	<i>Inflammatory bowel disease</i>
<i>Bipolar, Attn deficit (ADHD)</i>	<i>Irritable bowel disease</i>
<i>Birth defects</i>	<i>Leaky gut syndrome</i>
<i>Bloat (fatal)</i>	<i>Liver abnormalities</i>
<i>Bowel disease</i>	<i>Miscarriage</i>
<i>Cancer (some)</i>	<i>Morgellon's (NEW)</i>
<i>Celiac disease</i>	<i>Multiple sclerosis</i>
<i>Chronic fatigue syndrome</i>	<i>Obesity</i>
<i>Colitis</i>	<i>Pancreas abnormalities</i>
<i>Crohn's</i>	<i>Parkinson's</i>
<i>Dementia</i>	<i>Sudden Infant Death Syndrome</i>

1995 1997 1999 2001 2003 2005 2007 2009 2011

## **“The Perils of Ignoring History: Big tobacco Played Dirty and Millions Died. How Similar is Big Food?”**

**Brownell, K.D. and Warner, K.E. 2009. *The Milbank Quarterly* 87:259-294.**



**“1 in 4 El Salvadore sugar cane workers die of end-stage kidney failure”**

**“20,000 sugar cane workers die from end-stage Kidney failure in Panama and Niceragua”**

**“Glyphosate, hard water and nephrotoxic metals: ...Sri Lanka?”**  
Jayasumana et al. 2014. *Int. J. Environ. Res. Public Health* 11:2125-2147

## **The Autism Epidemic in the U.S. (US CDC Data)**



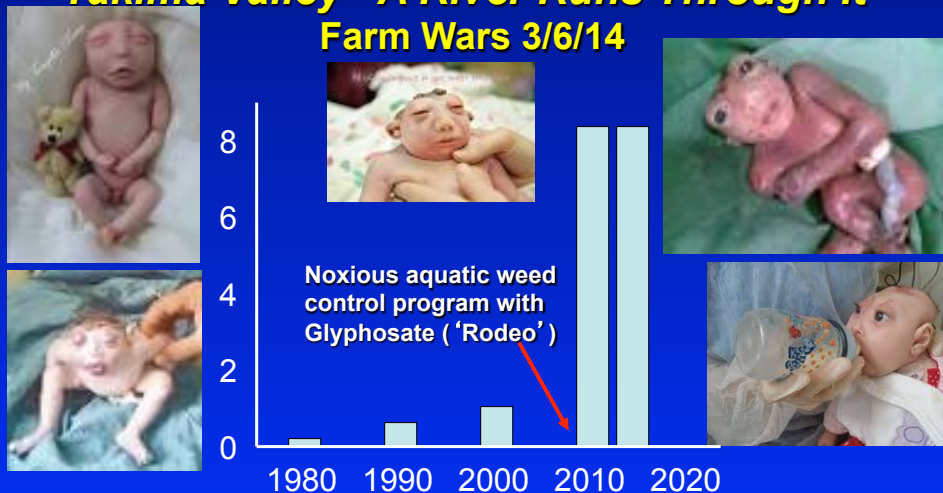
## One in Two in 2025?



The rate was 1 in 10,000 in 1970

## ***'Glyphosate, Brain Damaged Babies, and Yakima Valley - A River Runs Through It'***

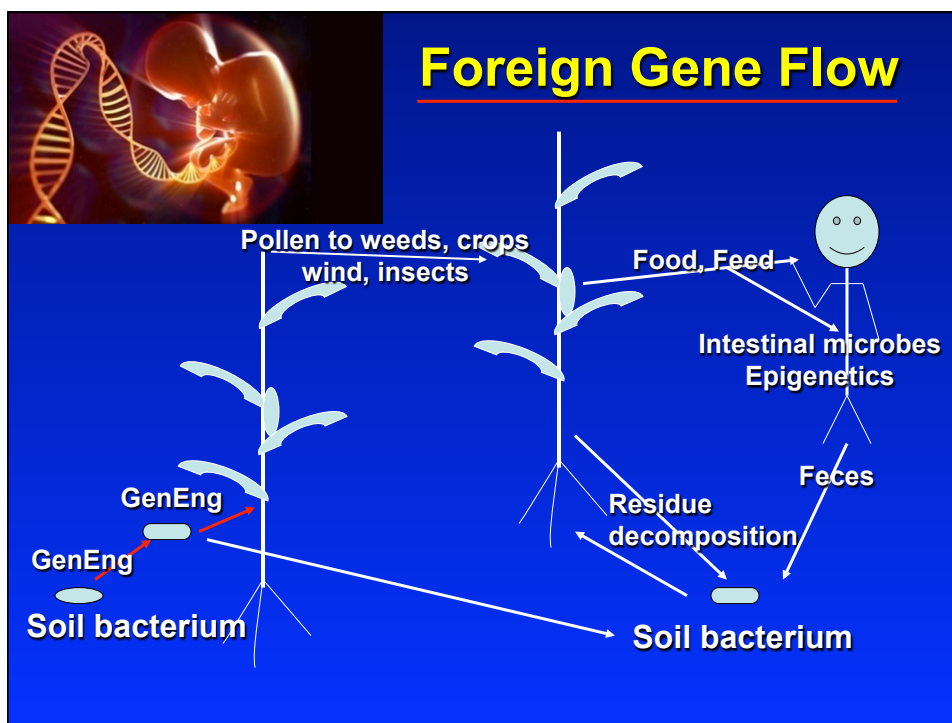
**Farm Wars 3/6/14**



***"Glyphosate, Three Rivers, and Anencephaly"***  
**Yakima Harold Republic**

## **Bt insecticide in Mother and Fetal Blood**

In January 2012, Bt insecticide was found in 93% of Canadian women tested at the Sherbrooke Medical Center in Montreal and 70% of the fetuses tested had Bt insecticide in their cord blood. Aris et al, 2012



## Flawed Safety Evaluations

### Consistency

1983 Tests associated with fraudulent practices

1991 Laboratory fraud found on plums, potatoes, grapes, and sugar beets:  
 “Falsifying laboratory notebook entries”  
 “Manually manipulating scientific equipment to produce false reports”  
 “Falsification of test results”

Indictment of the Laboratory Director and 14 employees on 20 felony counts  
 Laboratory President sentenced to five years in prison and fined \$50,000  
 Laboratory fined \$15.5 million + \$3.7 million restitution

1995 “Mode of action (still listed as) unknown”

1995 Company terminated study when animals died after feeding GMO corn

1996 NY Attorney General charged “False and Misleading advertising”

2003 Kawata, Japan. Reported fraudulent safety-testing data

2007 Monsanto convicted in France of false advertising (biodegradability)

2009 Convicted of false advertising in France

2011 India, Gallagher, “Failed International standards”-“woefully inadequate”

## Flawed Roundup Ready Safety Evaluations (Mesnage et al, 2014)

Control diet contained:

18 % Roundup Ready maize (NK603)

14.9 % Bt tolerant maize (Mon810)

110 ppb glyphosate

200 ppb AMPA

### DuPONT'S GMO CANOLA “SAFETY” STUDY EXPOSED

**TEST  
 GROUP**



**CONTROL  
 GROUP**

## Special Considerations in Fertilizing RR Crops

### Two factors: 1) Chemical; 2) Genetics

1. **Providing nutrient availability for yield and quality**  
 Compensate for reduced plant efficiency  
 Compensate for reduced soil availability  
 [Timing and formulation are important]
2. **Detoxifying residual glyphosate**  
 In meristematic root, stem, flower tissues, etc.  
 In soil [Ca, Co, Cu, Mg, Mn, Ni, Zn]
3. **Restoring soil microbial activity**  
 Nutrient related (N-fixation, Fe, Mn, Ni, S, Zn, etc.)  
 Disease control related (nutrition, pathogen antagonists, etc.)  
 Biological amendment (N-fixers, PGPRs, etc.)
4. **Alternatives to use of glyphosate**



## The 5 R's of Correction (Problem Solving)

1. Recognize the problem - LABELING
2. Remove the source
3. Restrict the damage
4. Remediate – Restitution
5. Restoration of the system



Future historians may well look back and write about our time, not about how many pounds of pesticide we did or did not apply; but about how willing we are to *sacrifice our children and jeopardize future generations* with this massive experiment we call genetic engineering that is based on false promises and flawed science, just to benefit the “bottom line” of a commercial enterprise.

*Dr. Don M. Huber, Professor Emeritus, Purdue University*

## **Basic Concept of Gut Physiology of All Animals**

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**“A thin wall, one cell thick stands between the host, its gut microbes and disaster!”**

S. Gorbach  
Tufts University

## **Importance of Epithelial Barrier Properties in the GI Tract**

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- Prevents epithelial permeabilization and toxin infiltration
- Prevents translocation of microbes
- Prevents antigen infiltration and activation of molecular mimicry processes
- An impaired barrier can lead to chronic inflammation: Inflammatory Bowel Disease
- Autoimmune disorders: Recognition of a central role for the gut in causation especially when barrier properties are impaired



## Sentinel Animal Populations

Are they trying to tell us something?

Some interesting cases



## Hemorrhagic Bowel Syndrome in Dairy Cattle



- An issue since the late 1990s
- Predominately seen in dairy cattle
- Sporadic limited occurrence and unable to reproduce experimentally
- Unknown etiology but associated with high production regimes
- A genetic component to susceptibility?
- Mortality: 85-100%

## Jejunal Hemorrhagic Syndrome in Dairy Cattle

- aka: Hemorrhagic Bowel Syndrome
- Frank hemorrhage in small intestine
- Extensive clotting and blockage
- Functional occlusion of the small intestine
- Gross enlargement of the intestines
- Animals go off feed and are in obvious pain and distress before death

## Focal Duodenal Necrosis in Layers

- First described in 1997, a priority problem to the industry
- Duodenal lesions and ulcerations
- Reduced egg weight and production, usually non fatal but costly
- Impaired calcium/iron absorption due to lesions: affects egg quality and bird health



## FDN in Layers

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- No known cause
- Antibiotic use can be used to treat the symptoms only
- Commonly recurs after treatment is stopped



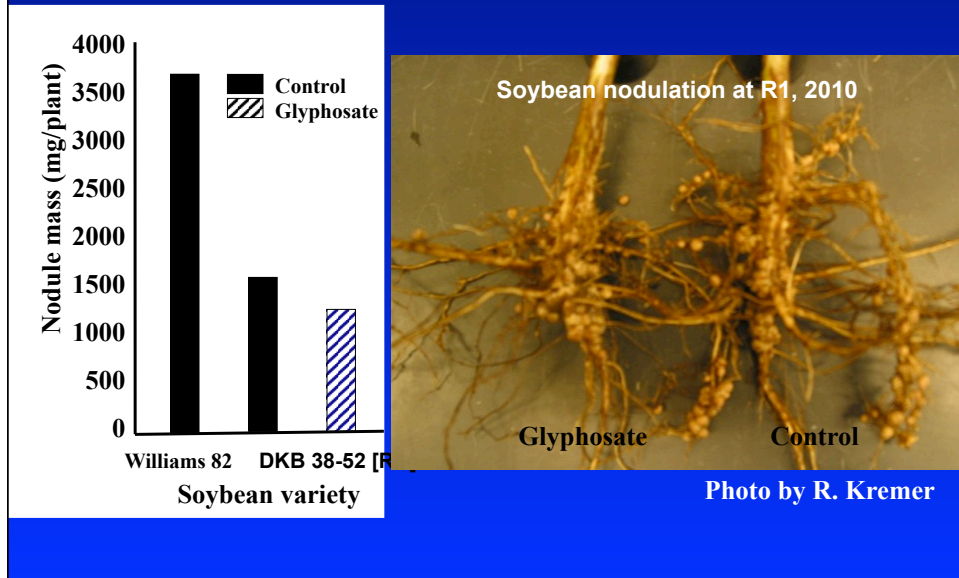
## Bird Flu, 2015

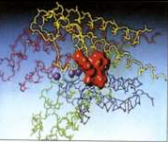
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- 46,000,000 Chickens & Turkeys died in the Midwest, USA
  - No Organically grown birds succumbed
  - No Free-range birds succumbed
- Unknown point of origin
  - Postulate feed associated
    - GE Protein enhancement
    - CAM 35S Viral promoter association
    - Glyphosate antibiotic disruption


## Effect of the RR Gene & Herbicide on Root Nodule Mass

After Kremer & Means, 2009





### GMO for Glyphosate Tolerance (Roundup Ready® Genes)



- The technology inserts alternative EPSPS genes (not blocked by glyphosate in *mature* tissue)
- More like a virus infection than plant breeding!
- **Nothing in the RR plant affects the glyphosate applied to the plant!**
  - Reduces nutrient uptake and function
- Causes a “Yield Drag”
- Glyphosate is there for the life of the plant
- Inserted “genes” are promiscuous

# Glyphosate Resistant Weeds

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It starts this way >>>>> and >>>>> Develops into this



## Failed Promises of Touted Benefits

- ✓ Higher yields
- ✓ Fewer pesticides
- ✓ Less post-harvest loss
- ✓ Improved N-fixation
- ✓ Drought and salt tolerance
- ✓ Increased photosynthesis
- ✓ Greater root growth & function
- ✓ Disease resistance
- ✓ Lower risks (economic)
- ✓ Lower cost
- ✓ Greater safety
- ✓ Simpler management – resistant weeds & pests

***BETRAYAL OF THE PUBLIC TRUST***



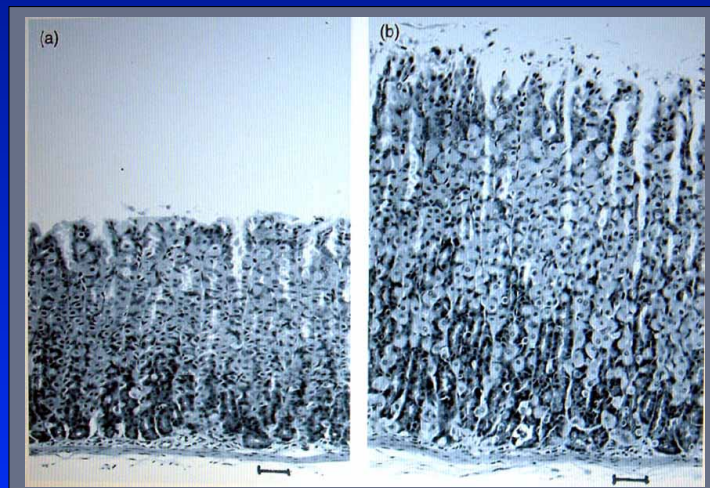
## Some SYMPTOMS of Glyphosate Damage

(Sub-herbicidal depending on rate and exposure time)

- ✓ Low vigor, stunting, slow growth
- ✓ Leaf chlorosis (yellowing) - complete or between the veins
- ✓ Leaf mottling - sometimes with necrotic flecks or spots
- ✓ Leaf distortion - small, curling, strap, wrinkling, 'mouse ear'
- ✓ Abnormal stem proliferation ( 'witches broom' )
- ✓ **Bud, fruit abortion**
- ✓ Retarded regrowth after cutting (alfalfa, perennial plants)
- ✓ Lower yields, lower mineral value
- ✓ Predisposition to infectious diseases - **NUMEROUS!**
- ✓ Predisposition to insect damage
- ✓ Induced abiotic diseases - drought, winter kill, sun scald
- ✓ Root stunting, poor growth, inefficient N-fixation and uptake
- ✓ **Bark cracking**

*after Univ. of Hawaii; Univ. of Connecticut, Ohio State University*

## Stomach lining



Non-GM

GM

## Are Bees (and Other Invertebrates) the Canaries in Our Coal mine?



## Glyphosate

- Indiscriminate use (330 million pounds/yr):
  - Systemic broad-spectrum general use herbicide
  - Herbicide of choice for 85+% of GE plants
- Effect on bees
  - Potent endocrine hormone disrupter
  - Potent antibiotic to *Lactobacillus*, *Bifidobacterium*, etc. - essential microbes for nutrition and pest resistance (immunity)
  - Strong mineral chelater in the bee, plants, & environment

**"Glyphosate, Three Rivers, and Anencephaly", Yakima Harold Republic**





## THE LETHAL IMPACT OF ROUNDUP ON AQUATIC AND TERRESTRIAL AMPHIBIANS

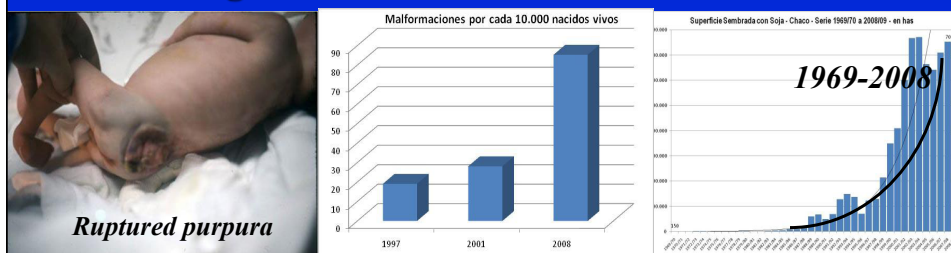
RICK A. RELYEA<sup>1</sup>

*Department of Biological Sciences, University of Pittsburgh, Pittsburgh, Pennsylvania 15260 USA*

**Abstract.** The global decline in amphibian diversity has become an international environmental problem with a multitude of possible causes. There is evidence that pesticides may play a role, yet few pesticides have been tested on amphibians. For example, Roundup is a globally common herbicide that is conventionally thought to be nonlethal to amphibians. However, Roundup has been tested on few amphibian species, with existing tests conducted mostly under laboratory conditions and on larval amphibians. Recent laboratory studies have indicated that Roundup may be highly lethal to North American tadpoles, but we need to determine whether this effect occurs under more natural conditions and in post-metamorphic amphibians. I assembled communities of three species of North American tadpoles in outdoor pond mesocosms that contained different types of soil (which can absorb the pesticide) and applied Roundup as a direct overspray. After three weeks, Roundup killed 96–100% of larval amphibians (regardless of soil presence). I then exposed three species of juvenile (post-metamorphic) anurans to a direct overspray of Roundup in laboratory containers. After one day, Roundup killed 68–86% of juvenile amphibians. These results suggest that Roundup, a compound designed to kill plants, can cause extremely high rates of mortality to amphibians that could lead to population declines.

## Birth Defects Based on RR Soybean Acreage & Glyphosate drift -Cordoba, Argentina area

- 447 % increase in birth defects - (1998-2008)
  - Heart - Anaphylactoid purpura
  - Musculoskeletal - Thyroid
- Increased miscarriages & other reproductive failures
- Cancers in children- and adults, Liver diseases increased
- Neurological disorders increased - esp. in children
- Acute allergies increased



## Birth Defects from Endocrine Hormone Disruption in Mammals



**"Underbite and cleft palate are epidemic in human newborns. These malformations on human newborns are similar and comparable to underbites and cleft palate on other mammal young and to short upper bill and holes in the upper bills of hatchling birds. These malformations are definitive symptoms of disruption of the thyroid hormones during development in the womb or egg." (Hoy, 2011)**

No, Kevin, there is no consensus on the safety of GMOs. Quite the contrary: <http://gmofreeusa.org/gmos-are-top/there-is-no-scientific-consensus-on-the-safety-of-gmos/>  
<http://gmofreeusa.org/gmos-are-top/gmo-science-studies/>

**WHO DO YOU BELIEVE?**

<p>ANTI-LABELING/ANTI-SCIENCE</p>  <p><b>"We know they are safe."</b>        Kevin Folta        Interim Chairman,        Horticultural Sciences        University of Florida</p> <p><small>www.facebook.com/gmofreeusa</small></p>	<p>PRO-LABELING/PRO-SCIENCE</p>  <p><b>"Any scientist who tells you that GMOs are safe or not to worry about it, is either ignorant of the history of science or is deliberately lying. Nobody knows what the long term effect will be."</b>        David Suzuki        Geneticist</p> <p><small>www.gmofreeusa.org    www.facebook.com/gmofreecanadagroup</small></p>
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GMO Free USA

## Flawed Safety Evaluations

### Internal EPA Memos

1983 EPA Scientist :“Our viewpoint is one of protecting the public health when we see suspicious data.” Unfortunately, EPA has not taken that conservative viewpoint in its assessment of glyphosate’s cancer causing potential.”

“There are no studies available to NCAP evaluating the carcinogenicity of Roundup or other glyphosate-containing products. Without such tests, the carcinogenicity of glyphosate-containing products is unknown.”

“Tests done on glyphosate to meet registration requirements have been associated with fraudulent practices.”

“Countless deaths of rats & mice are not reported.”

“Data tables have been fabricated”

“There is a routine falsification of data”

“It is also somewhat difficult not to doubt the scientific integrity of a study when the IBT stated it took specimens from the uteri of male rabbits for examination.”

Wikipedia, 2012

## Bt Egg Plant Toxicology Evaluation

Gallagher, 2011

### Summary:

- \* The study failed to meet international standards for evaluation (OECD 1998; Codex Alimentarius, 2003 c-c)
- \* There were serious departures from normal scientific standards
- \* Studies submitted are ‘woefully inadequate to determine safety’
- \* Consists of substandard and extremely misleading interpretation of the results presented
- \* Independent study can not uphold the government report of approval

