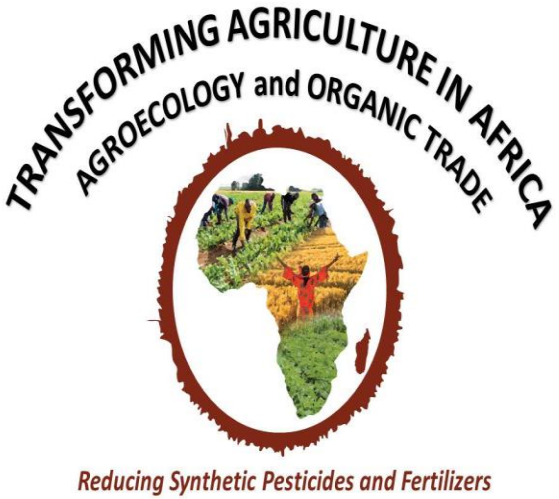


Understanding GMOs and Glyphosate's Universal Toxicity to Soil, Plants, Animals, and Humans

Don M. Huber
Professor Emeritus, Purdue University

Genetic Engineering has been Promoted as the 21st Century Silver Bullet to Solve:

- Hunger and Malnutrition
- Climate change
- Economic well being
- Food safety and security
- Toxic chemical usage
- Environmental degradation
- Agricultural sustainability

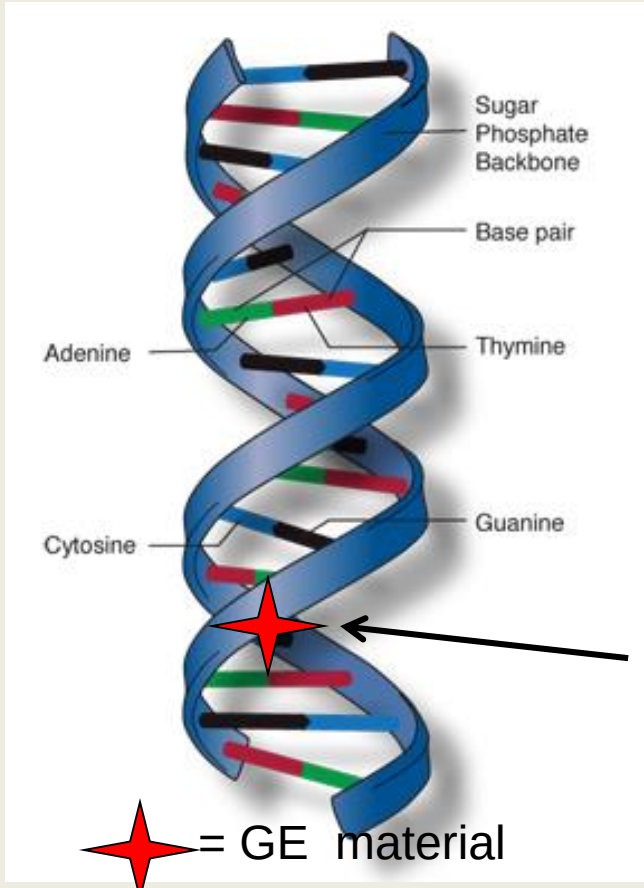
It has failed on all points!

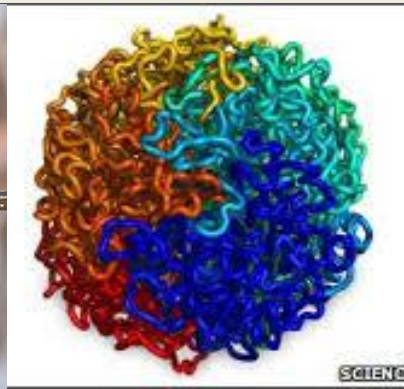
Consequences of Indiscriminate Use

- **Sick Soils**
  - Sterile - infertile
  - Polluted/contaminated
- **Vanishing Ecological Support**
  - Vanishing pollinators
  - Malnutrition
  - Deteriorating water quality & retention
- **Deteriorating Crop & Animal Health**
  - Malnutrition
  - Acute and chronic diseases
  - Infertility
- **Increased Human Suffering**
  - Malnutrition
  - Disease epidemics
  - Infertility

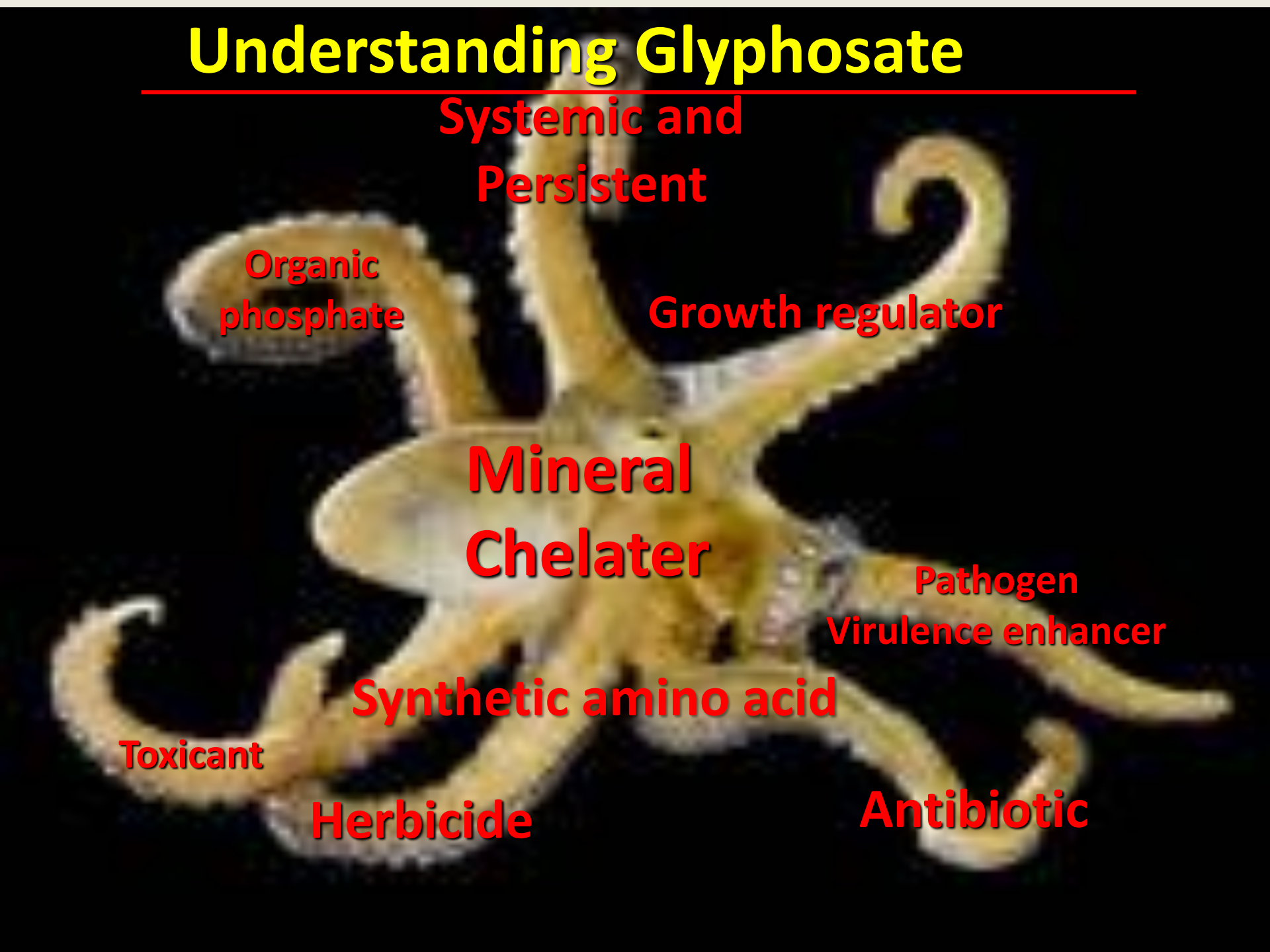
Genetic Engineering is Based on Fossil Science

- GE is based on one gene, one function. GE is like a virus infection; not breeding.
- The code in GM crops is radically changed from that of the recipient and also the donner sources. GE changes the bases, spatial, amino acid, 'environmental' & internal relationships.
- There is nothing in the GE plant that nullifies the herbicide applied!
- The genetic material is 'promiscuous'.
- Always a yield drag.
- TWO THINGS TO CONSIDER: Consequences of genetics and products produced or tolerated





Understanding Glyphosate



Some Diseases Increased by Glyphosate

Host plant	Disease	Pathogen
Apple	Canker	*Botryosphaeria dothidea*
Banana	Panama	*Fusarium oxysporum* f.sp. *cubense*
Barley	Root rot	*Magnaporthe grisea*
Beans	Root rot	*Fusarium solani* f.sp. *phaseoli*
Bean	Damping off	*Pythium* spp.
Bean	Root rot	*Thielaviopsis bassicola*
Canola	Crown rot	*Fusarium* spp.
Canola	Wilt	*Fusarium oxysporum*
Citrus	CVC	*Xylella fastidiosa*
Corn	Root and Ear rots	*Fusarium* spp.
Cotton	Damping off	*Pythium* spp.
Cotton	Bunchy top	Manganese deficiency
Cotton	Wilt	*F. oxysporum* f.sp. *vasinfectum*
Grape	Black goo	*Phaeomoniella chlamydospora*
Melon	Root rot	*Monosporascus cannonbalus*
Soybeans	Root rot, Target spot	*Corynespora cassicola*
Soybeans	White mold	*Sclerotina sclerotiorium*
Soybeans	SDS	*Fusarium solani* f.sp. *glycines*
Sugar beet	Rots, Damping off	*Rhizoctonia and* Fusarium
Sugarcane	Decline	*Marasmius* spp.
Tomato	Wilt (New)	*Fusarium oxysporum* f.sp. *pisi*
Various	Canker	*Phytophthora* spp.
Weeds	Biocontrol	*Myrothecium verucaria*
Wheat	Bare patch	*Rhizoctonia solani*
Wheat	Glume blotch	*Septoria* spp.
Wheat	Root rot	*Fusarium* spp.
Wheat	Head scab	*Fusarium graminearum*
Wheat	Take-all	*Gaeumannomyces graminis*


Fusarium scab

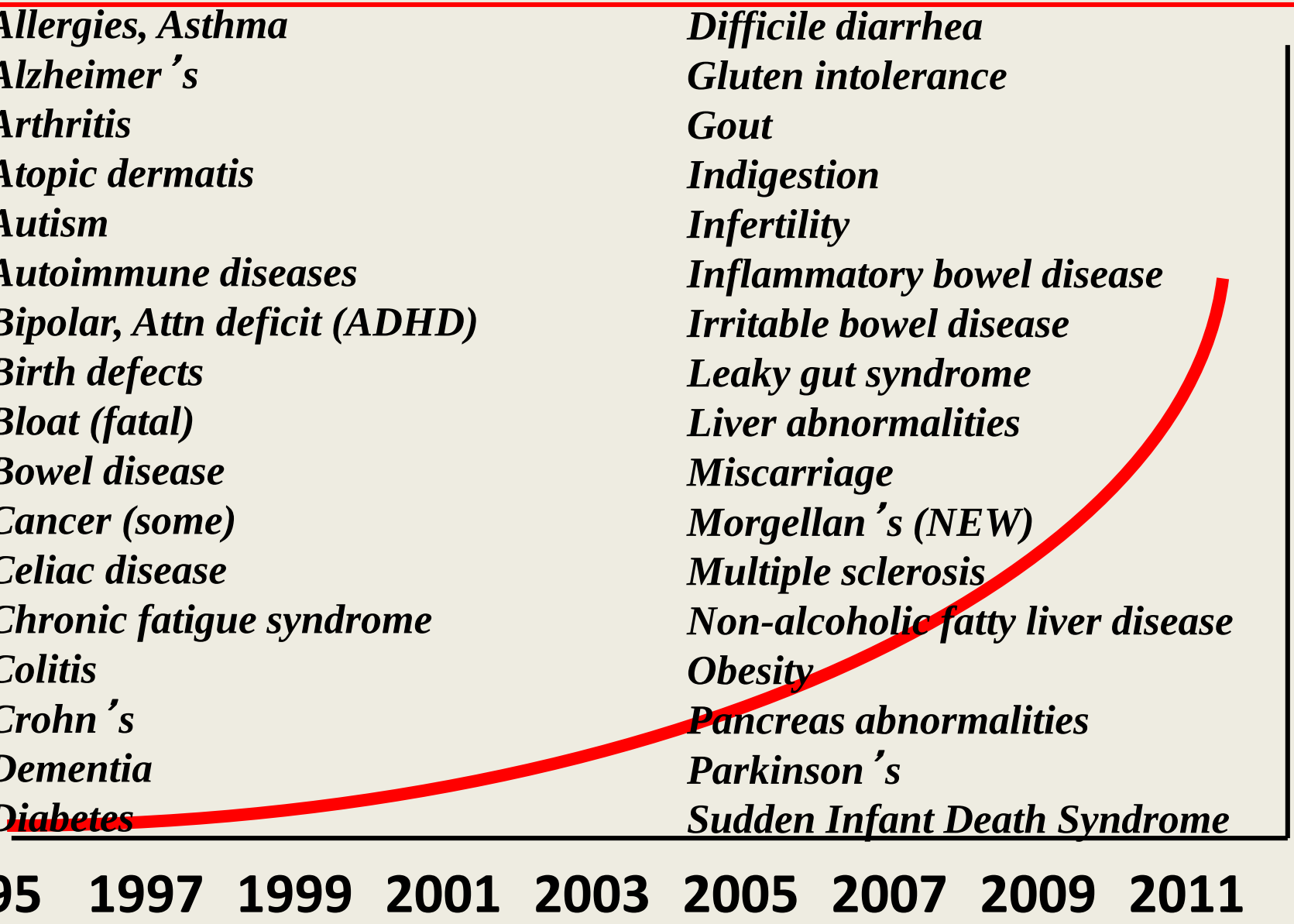

Take-all root rot

Food and Feed Safety Concerns

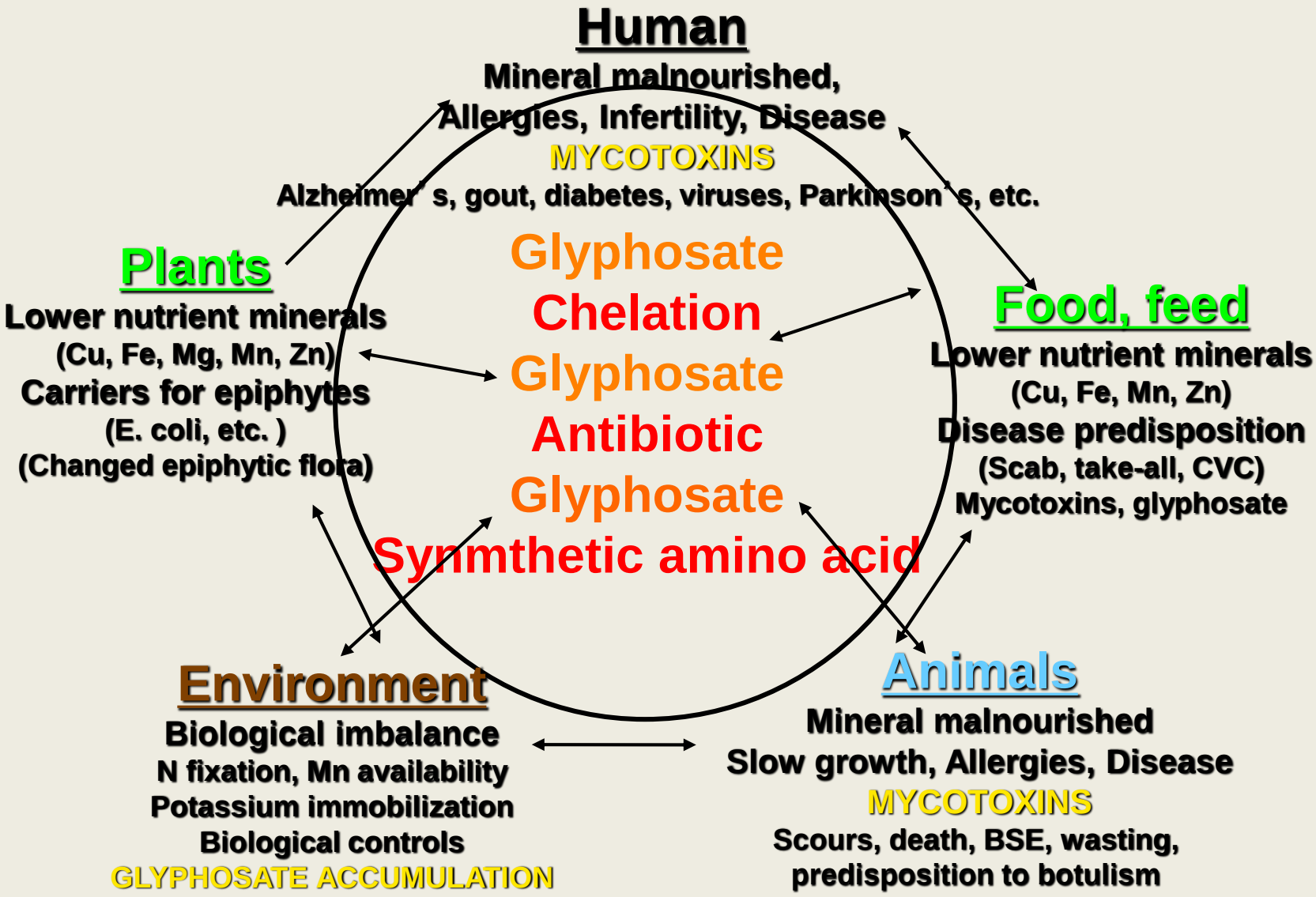
- **Reduced nutrient density**
  - Co, Cu, Fe, Mg, Mn, Zn
- **Increased levels of toxic products**
  - Mycotoxins [Fusarium toxins (DON, NIV, ZEA), aflatoxins]
  - Allergenic proteins and metabolic toxins
- **Premature ageing, reproductive failure**
- **Ecological disruption**
  - bees, amphibians, plant diversity, GI tract, soil, etc.
- **Direct chronic toxicity of glyphosate**
  - Cell death, immune failure, disease susceptibility
  - Endocrine system, infertility, birth defects, teratogenicity

Diseases Increasing in Incidence (Epidemic)

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



Far-Reaching Ecological Impact of Glyphosate



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.

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