

Plant-Based Minerals and How They Remediate Glyphosate's Harm

with

Caroline Alan, Mineral Geek
& Co-Founder of BEAM Minerals





Presentation Agenda

GMO

What does it really mean?

The GMO-Glyphosate Connection

How glyphosate ended up in our food and bodies

What you need to know

How glyphosate works and health correlations

Glyphosate Remediation & Detoxification

Via plant-based humic & fulvic substances



What Does GMO Mean?

Genetically
Modified
Organism

Not just about making
a bigger strawberry!



GMOs have been around for 1000s of years

- Farmers have been modifying crops since the invention of agriculture
- Even "non-GMO" produce has been modified by selective breeding
- GMOs are not inherently dangerous! What matters is how you use them

Wild Banana

GMO Banana

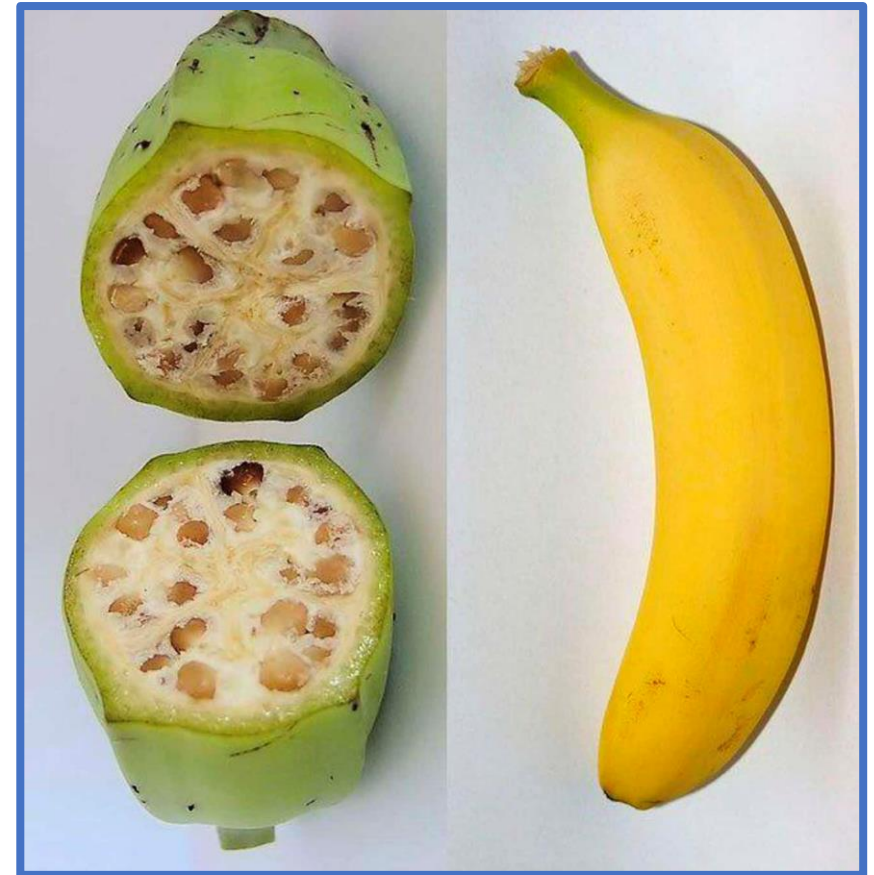
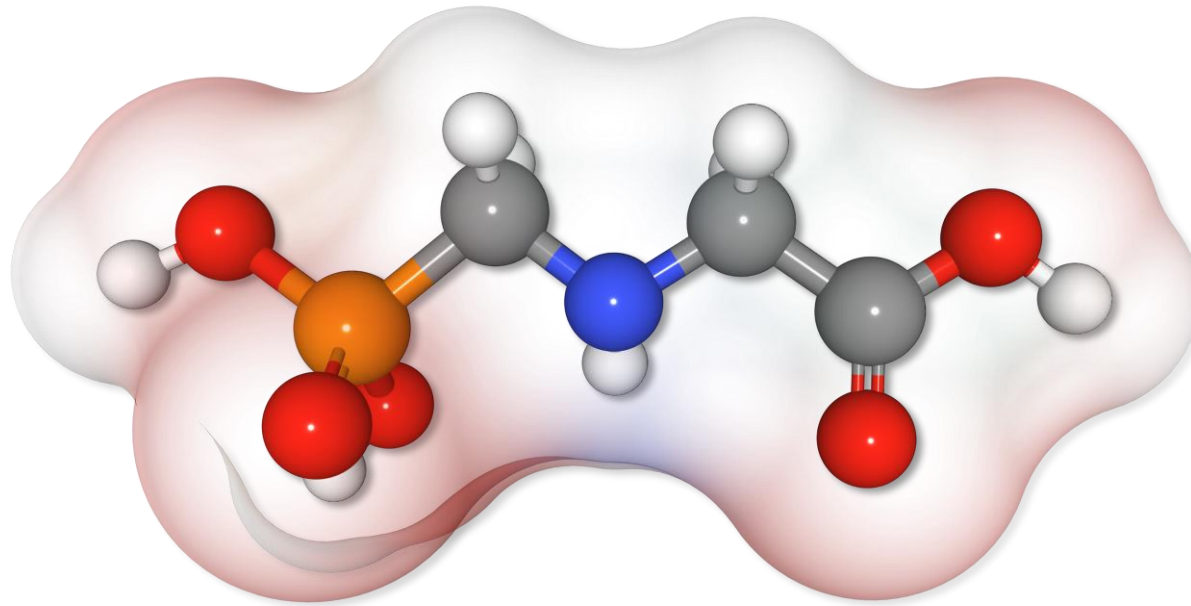


Photo: [Warut Roonguthai/Wikimedia Commons](#) / [Blisko Przyrody/Pixabay](#)

The Problem Isn't GMOs—It's Glyphosate!



What is Glyphosate?

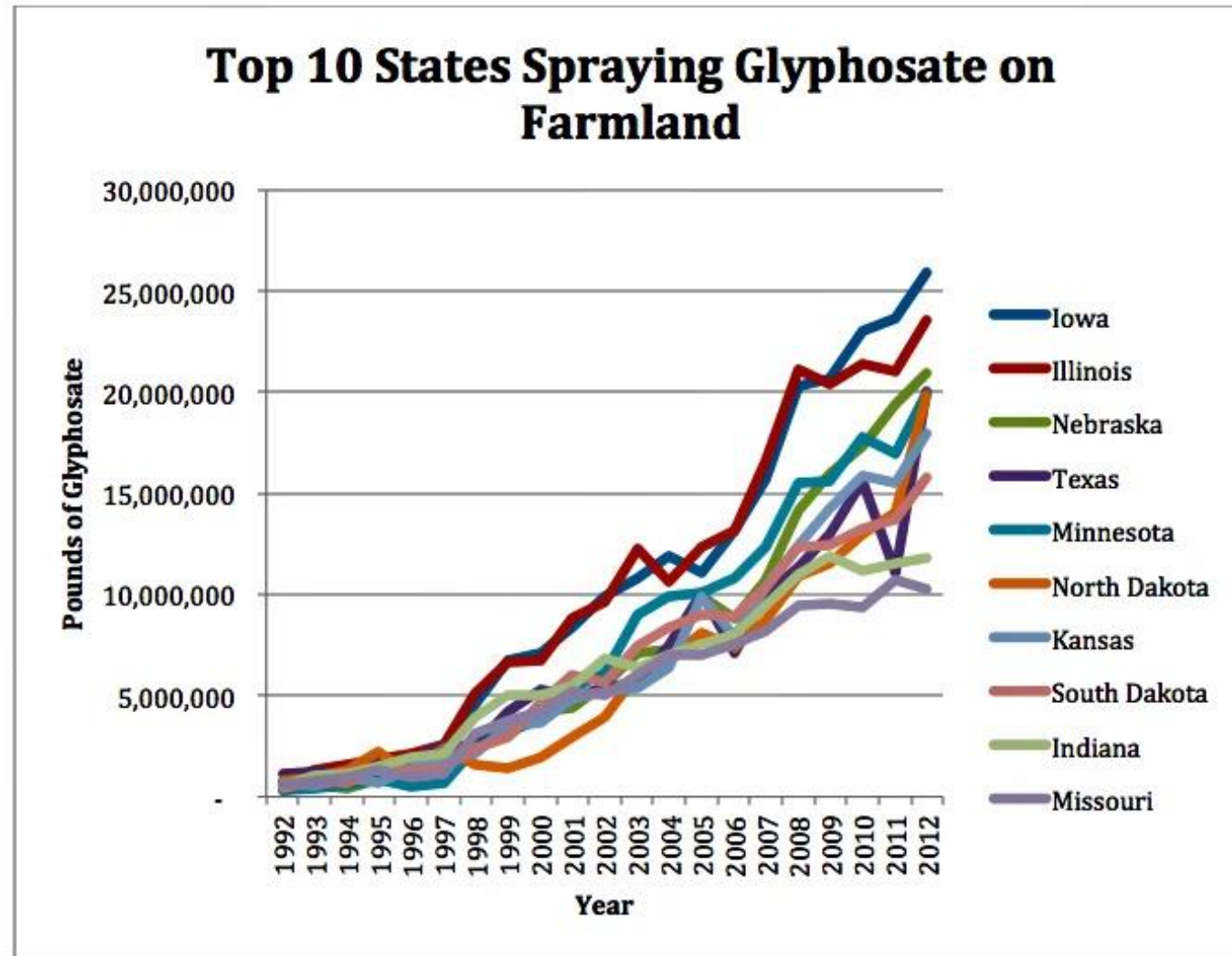
That weedkiller you or your neighbors may have sprayed on those annoying blackberries or the weeds growing out of the cracks in your driveway.



Where did Glyphosate come from?

- Developed in 1970 and brought to market in 1974 as a weedkiller, for both commercial farming and home gardening (trade name: Roundup)
- Within a few years glyphosate became the #1 commercial and #2 home gardening weedkiller (herbicide)
- Use skyrocketed in production farming after creation of GMO “Roundup-Ready” crops (soybeans in 1996, corn in 1998, then cotton, beets, wheat, and others)

Glyphosate Use has Grown Exponentially



Health Concerns Have Grown Exponentially

- Global use increased 100x from 1974 to 2016 and continued on up from there
- Currently glyphosate is the most popular pesticide in the world
- Glyphosate was never officially classified as toxic. However, it has been the focus of numerous lawsuits and government reviews
- As of 2020, its parent company has paid over \$10 billion in legal settlements for glyphosate's links to Non-Hodgkin's Lymphoma and other health issues

How Did Glyphosate End up in Our Food?

The problem that farmers wanted to solve . . .

Increase crop production (yield per acre) by decreasing weeds, which can ruin crops and make them hard to harvest.

A problem solved and problem created...

Glyphosate can increase crop yields and kill weeds, but it comes with some unwanted negative side effects.

The GMO/Glyphosate Connection



Agri-biz created genetically modified seeds so that when grown, they would produce crops that are glyphosate resistant.

This technology is called:
Roundup Ready Crops

Glyphosate Use in Production Farming



The same Roundup weedkiller that is used by consumers, is being sprayed directly onto genetically modified (GMO) foods that we all eat . . .

Only it's stronger!

Adjuvants & Surfactants Increase Bioavailability

- In Production farming, Roundup is mixed with Adjuvants and Surfactants, which increase its bioavailability.
- Adjuvants and surfactants work like soap, making the glyphosate stick to the plants better.
- These compounds also make the glyphosate molecule slower to breakdown.



The Result?



The genetically modified plants live while the weeds die.

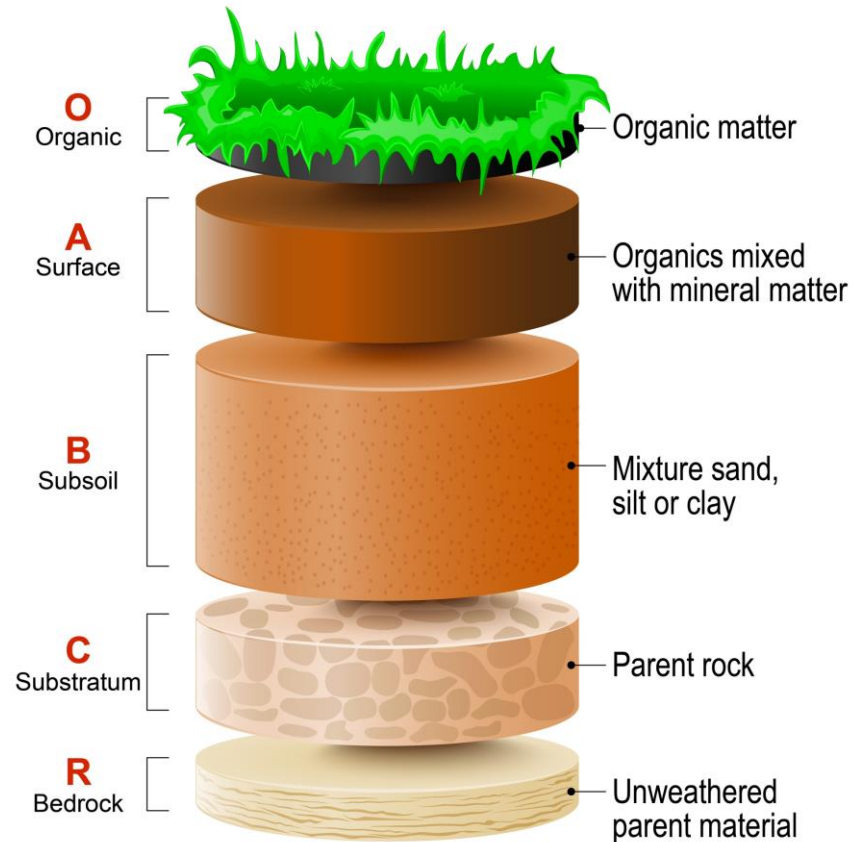
This makes it easier for farmers to harvest their crops.

The problem:

- Microorganisms in the soil also die.
- The crops carry the glyphosate to your body.

Glyphosate Application Affects Soil Quality

SOIL LAYERS



- Soil that has had multiple applications of glyphosate (per growing season) begins to lose its structure as its organic components die
- As these top layers of soil lose their organic and mineral components, the soil becomes increasingly difficult to cultivate
- It takes *at least* 100 years to build an inch of topsoil — but it can take as many as 500 years for topsoil to develop

Production Farming Creates Systemic Glyphosate Exposure

Agricultural runoff brings glyphosate into the water table



Agricultural drift puts glyphosate into the air

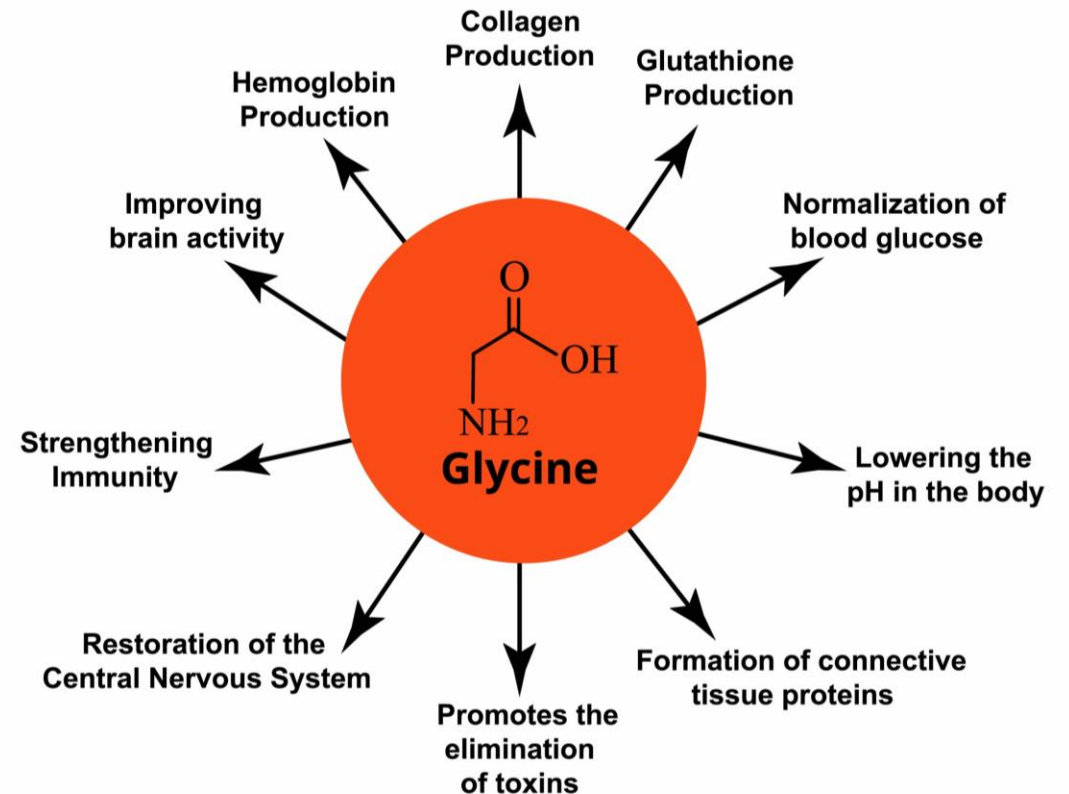


How Glyphosate Works

The Trojan Horse Method

- Glyphosate mimics **glycine**, a simple amino acid, so it enters the plant like a trojan horse
- **Glycine** is one of the most important amino acids and is key to many functions
- When mixed with adjuvants and surfactants glyphosate's absorption capacity is exponentially greater

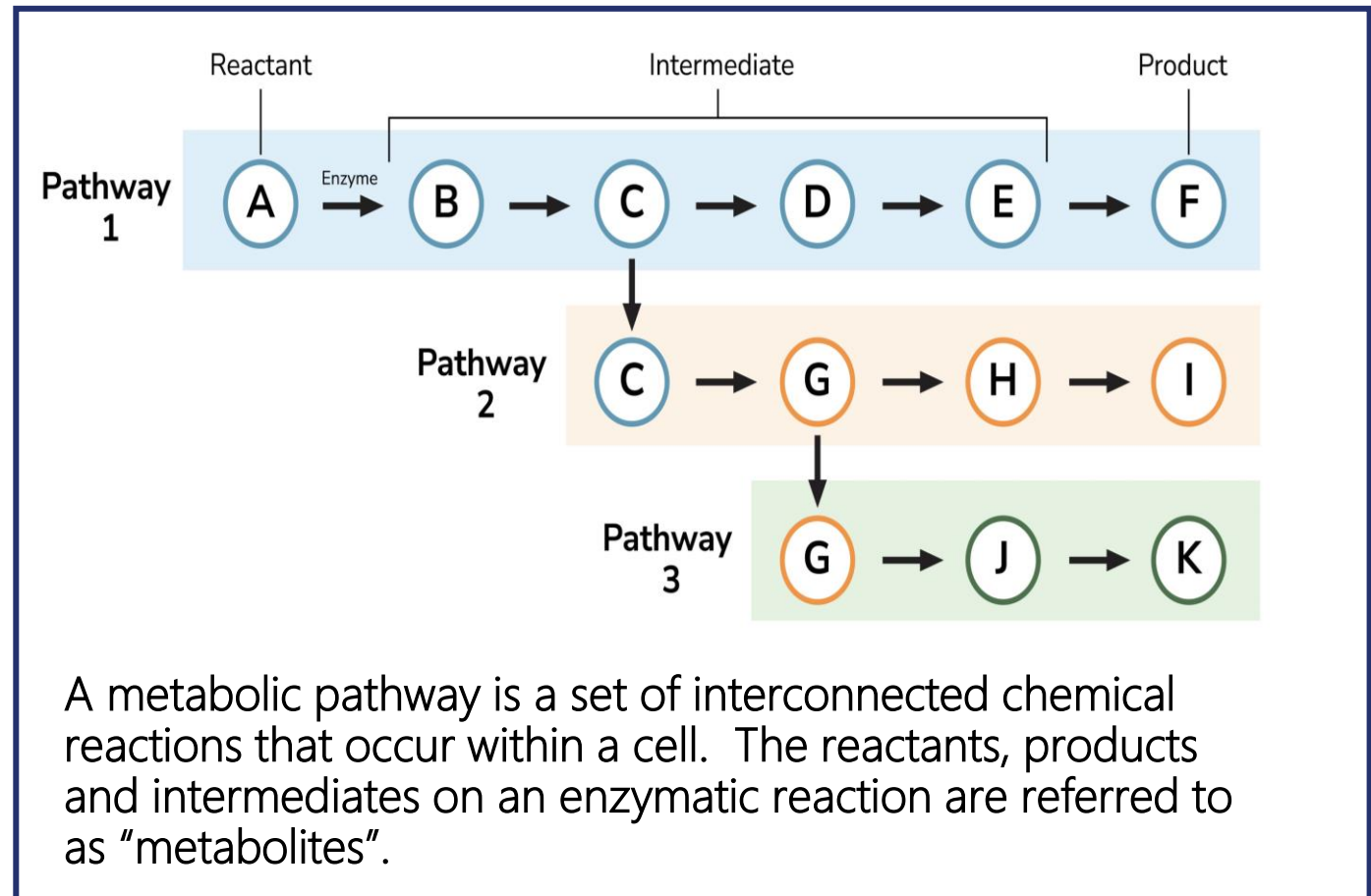
Glycine Functions



How Glyphosate Works

Glyphosate Inhibits the Shikimate Pathway

The Shikimate (or “Shikimic”) Pathway is a seven-step set of metabolic processes used by bacteria, fungi, algae, some protozoa, and plants for the biosynthesis of some folates and **aromatic amino acids**, specifically tyrosine, phenylalanine and tryptophan.



How Glyphosate Works

Shikimate Pathway Disruption

Glyphosate attacks an organism's ability to make amino acids.

First, it inhibits an enzyme in plants and bacteria called:
5-enolpyruvylshikimate-3-phosphate (EPSP) synthase

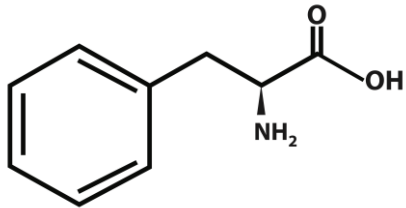
Then, without this enzyme, 3 specific amino acids can't be synthesized:
phenylalanine, tyrosine, and tryptophan

The plant or bacterium eventually dies from a lack of essential amino acids

Importance of the Shikimate Pathway

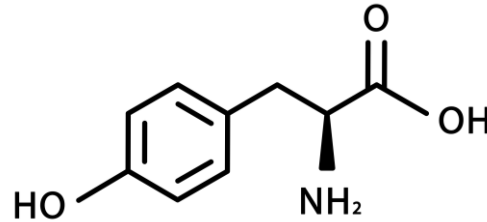
The Shikimate Pathway utilizes and produces essential amino acids, specifically:

Phenylalanine:



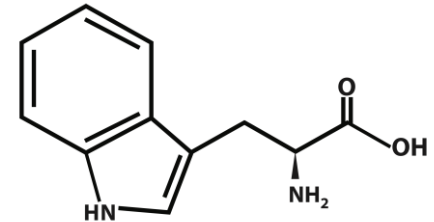
A crucial component in the production of proteins, neurotransmitters and hormones.

Tyrosine:



An essential component for the production epinephrine, norepinephrine, and dopamine.

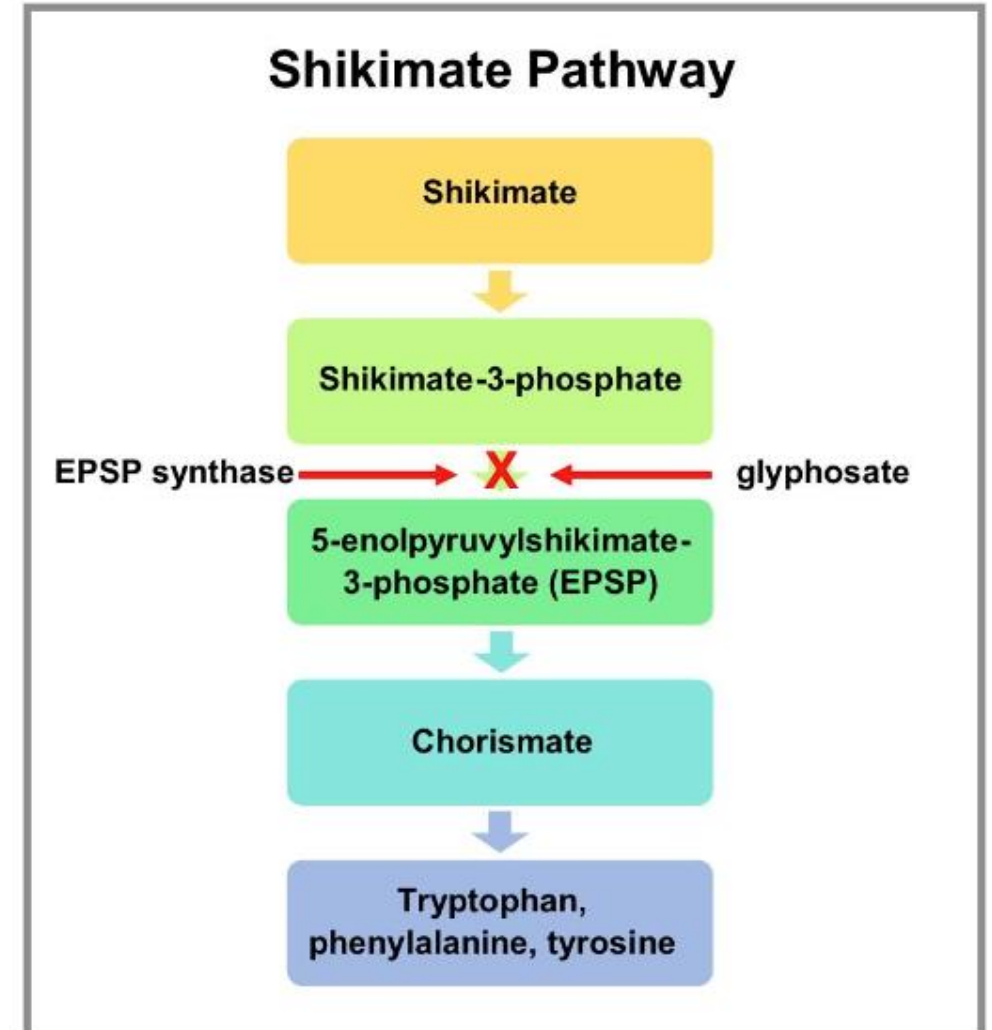
Tryptophan:



Critical to the production of melatonin and serotonin.

Weeds and your Gut: What's the Connection?

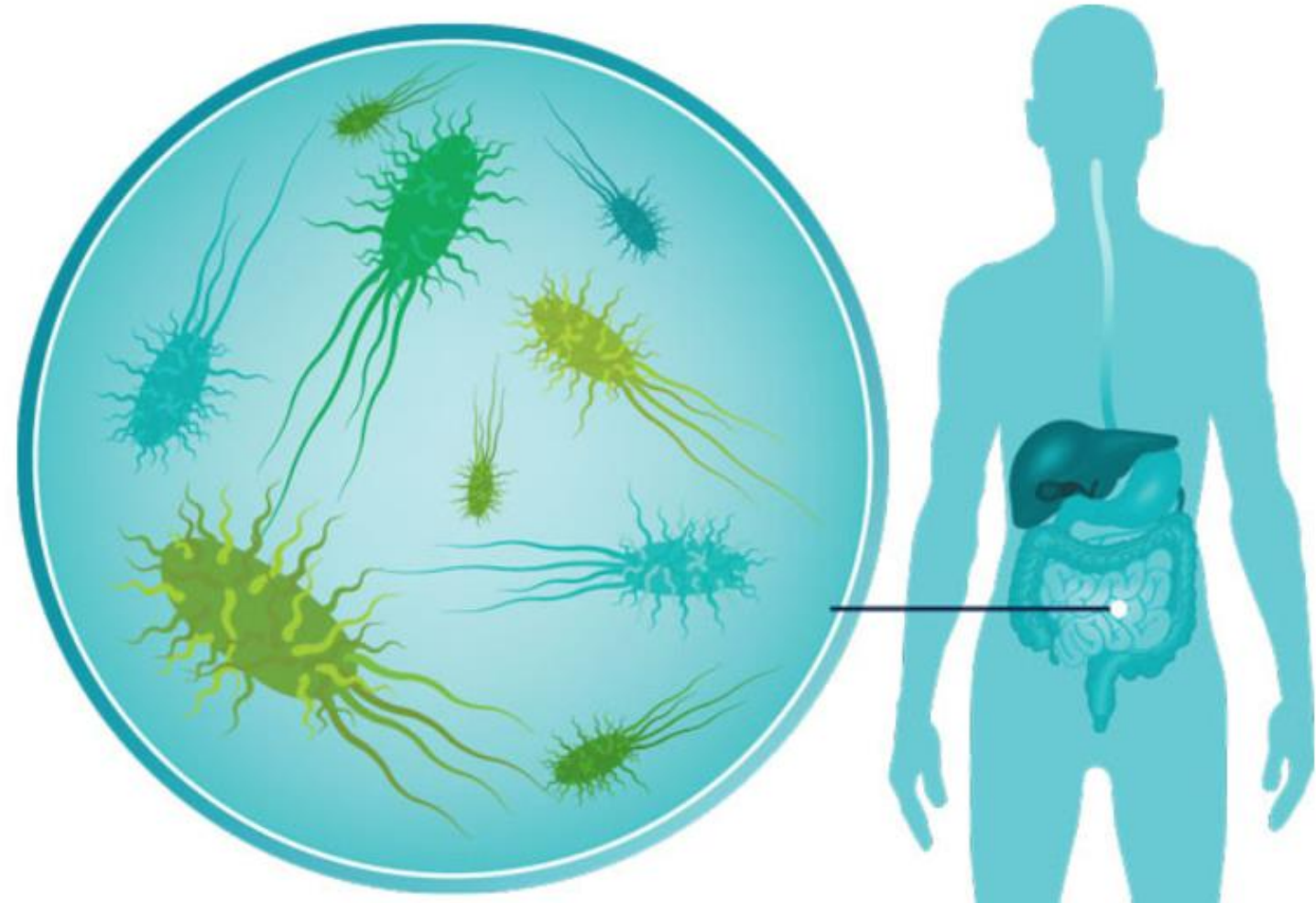
Scientists originally believed that the Shikimate Pathway was not found in animals.



Weeds and Your Gut: What's the Connection?

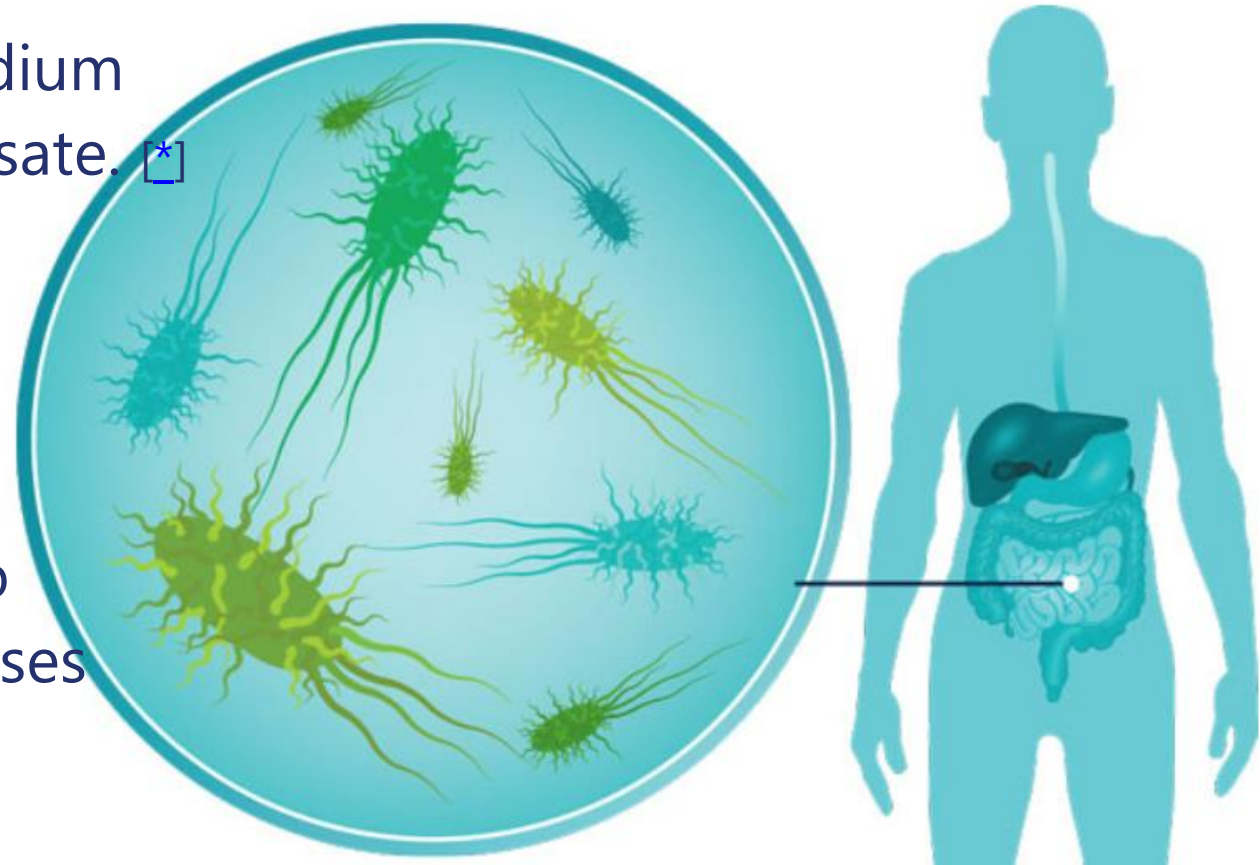
OOPS . . .

Except the human gut
is full of beneficial
bacteria, fungi, algae
and protozoa.



The Weeds in Your Gut

- A 2019 study found that glyphosate preferentially kills beneficial gut bacteria. [1]
- Several common pathogens like, Clostridium and Salmonella, are resistant to glyphosate. [2]
- When glyphosate kills good bacteria in the gut, the bad bacteria can grow.
- A 2022 study found that more than half of human gut bacteria are susceptible to glyphosate and that exposure likely causes gut dysbiosis. [3]



How Glyphosate Works in the Human Body

Once absorbed Glyphosate starts creating problems:

1. It chelates (binds to) beneficial minerals and micronutrients, particularly calcium, magnesium, iron, molybdenum and copper. [[*\]](#)
2. It inhibits CP450 Enzymes – the same enzymes that are inhibited in gluten intolerance and celiac disease. [[*\]](#)
3. It enhances uptake of aluminum, which affects pineal gland function. [[*\]](#)

Glyphosate Exacerbates Mineral Depletion

Which causes many chronic symptoms . . .



HYDRATION ISSUES



SLEEP ISSUES



ANXIETY



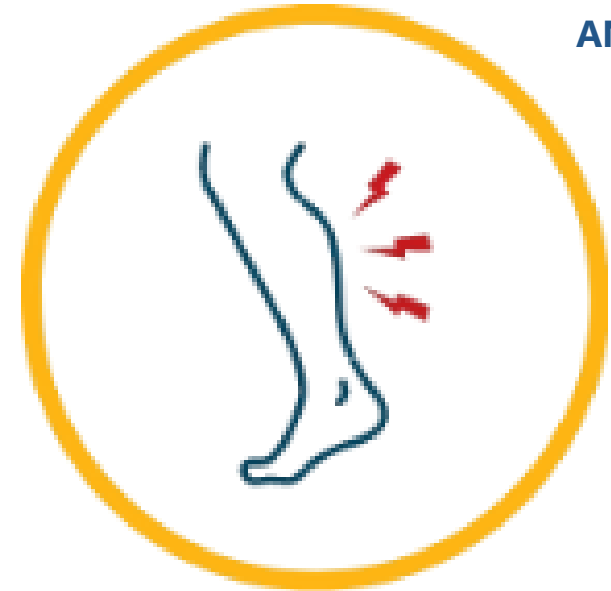
HEADACHES



ENERGY ISSUES



HAIR LOSS



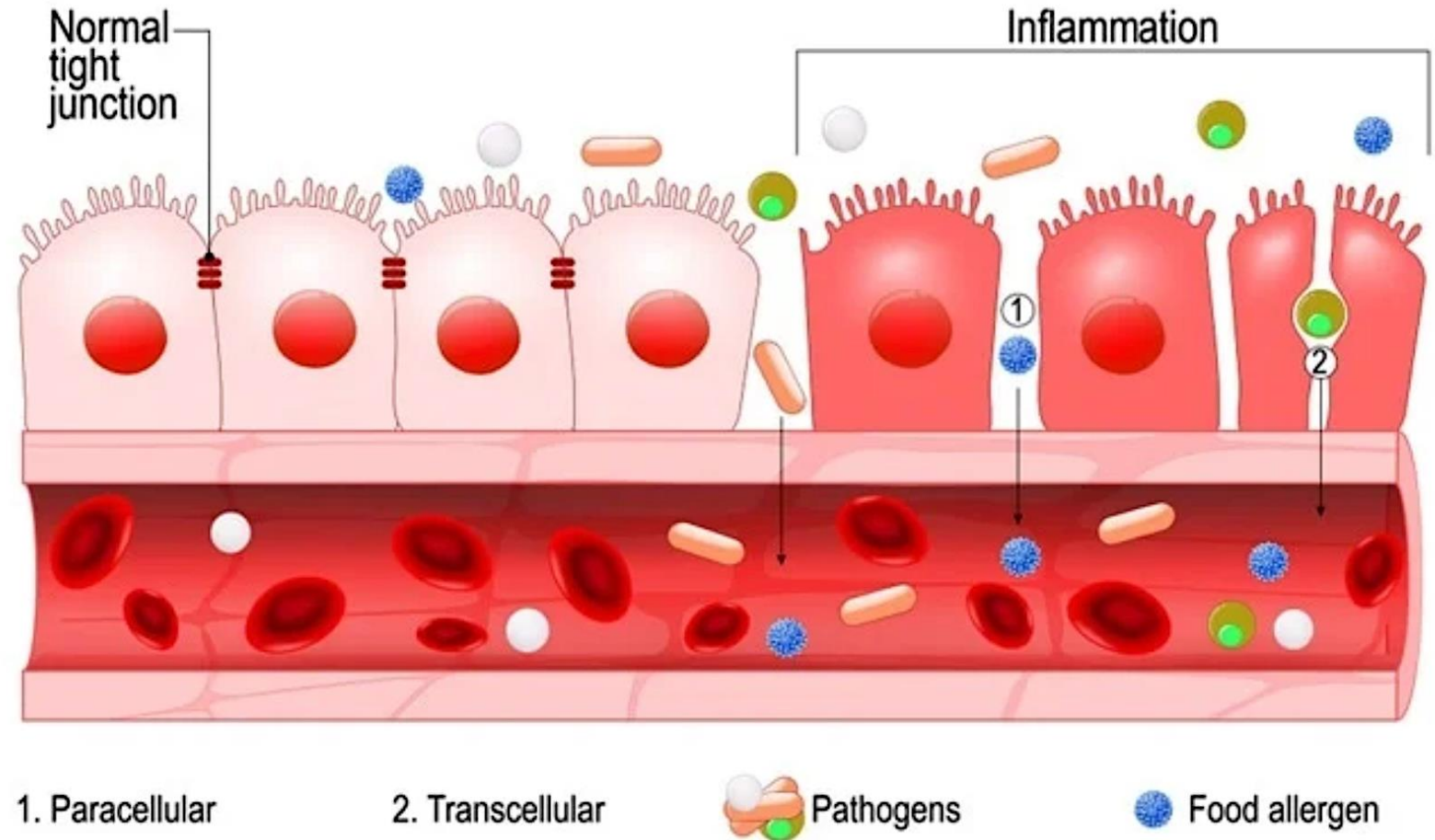
CRAMPING

Glyphosate Inhibits Cytochrome P450 Enzymes

Which affects tight junctions in the GI tract

As the first line of defense against environmental toxins and undigested food particles, tight junctions are crucial to a healthy gut microbiome.

The results are what is well-known as “Leaky Gut”



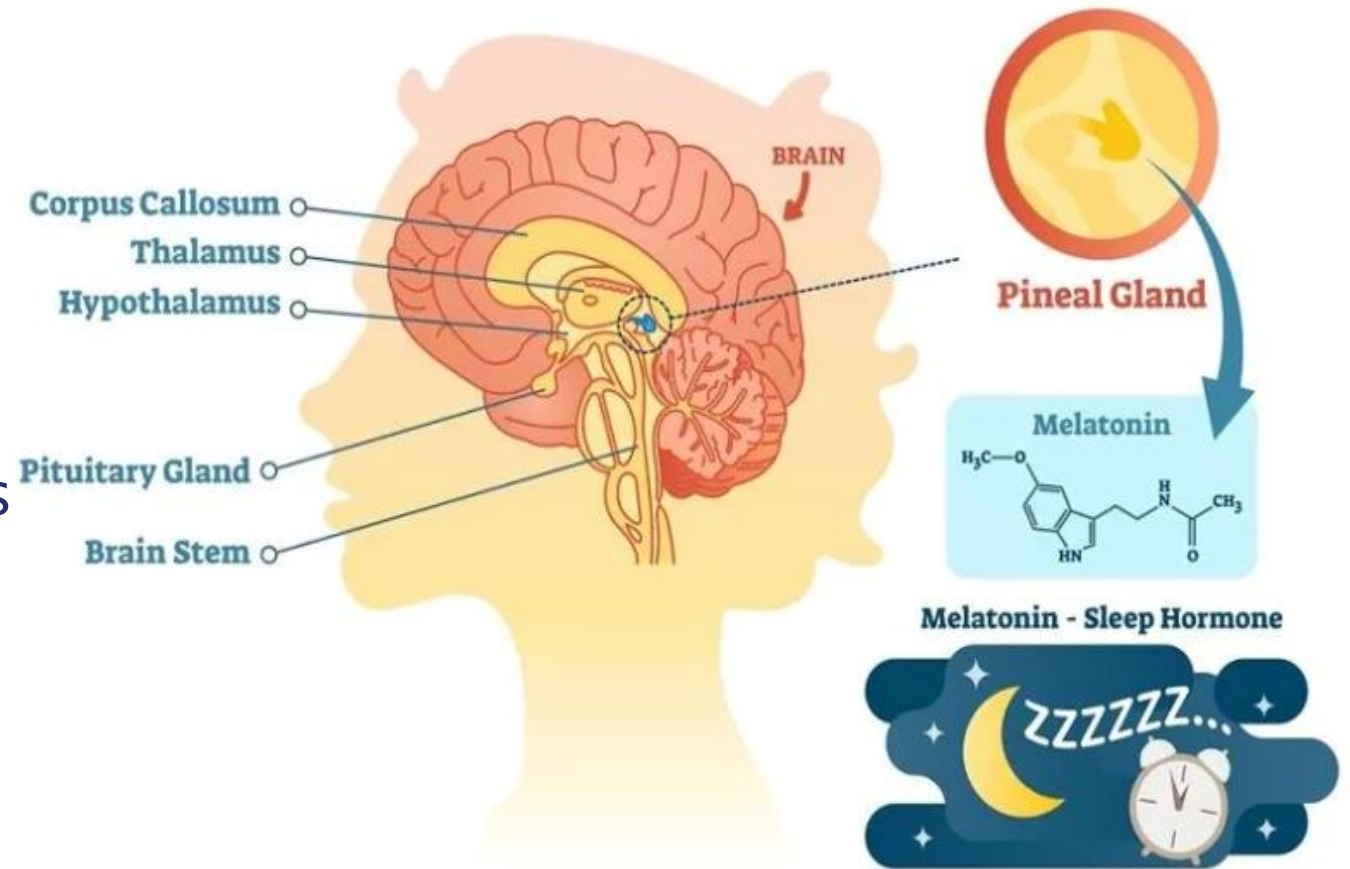
Glyphosate Affects Pineal Gland Function

Which interrupts melatonin production & serotonin synthesis

Glyphosate binds with aluminum, increasing its bioavailability—aluminum gets stored in the pineal gland, which affects melatonin and serotonin production. [*]

This factors into multiple health issues including:

- Sleep issues [*]
- Mood and mental disorders [*]
- Alzheimer's & dementia [*]

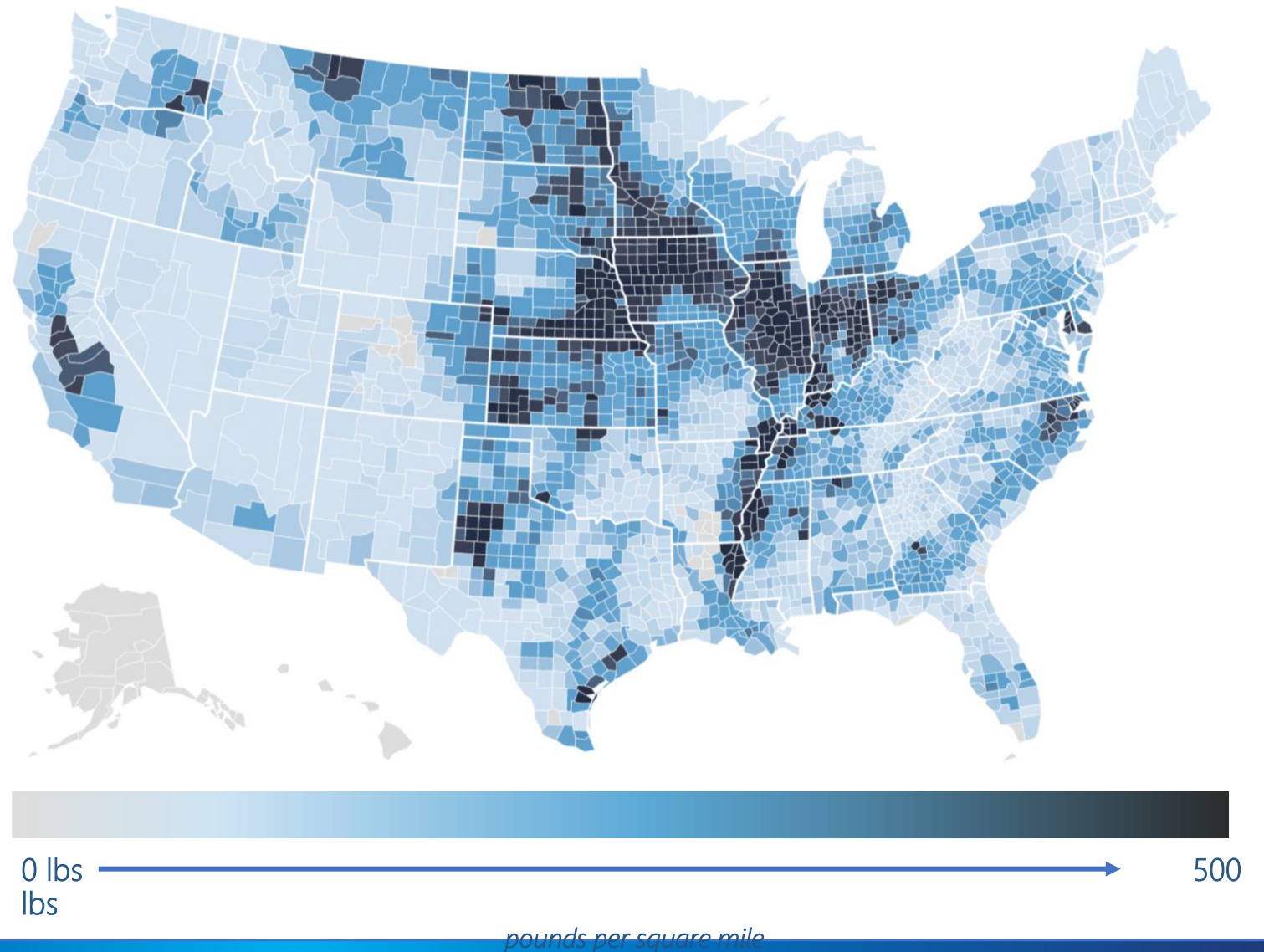


The Realities of Glyphosate Exposure

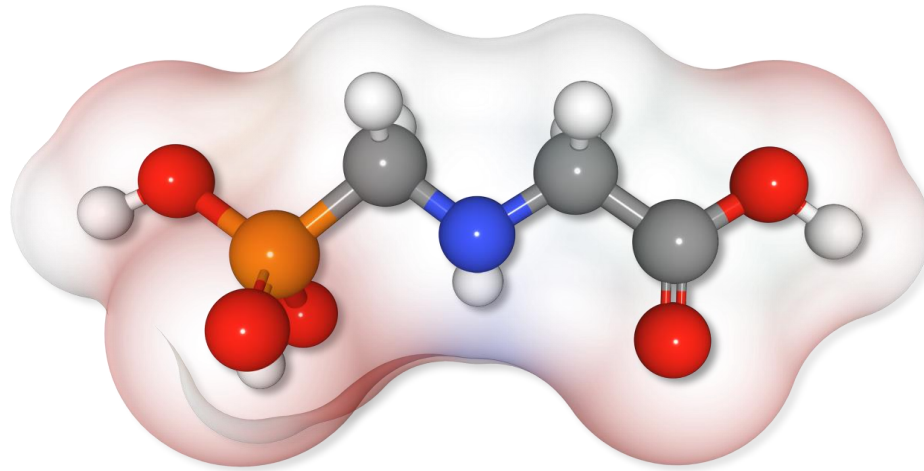
This map shows pounds of glyphosate sprayed for agricultural purposes.
(per square mile)

Note:

This doesn't include landscaping use.

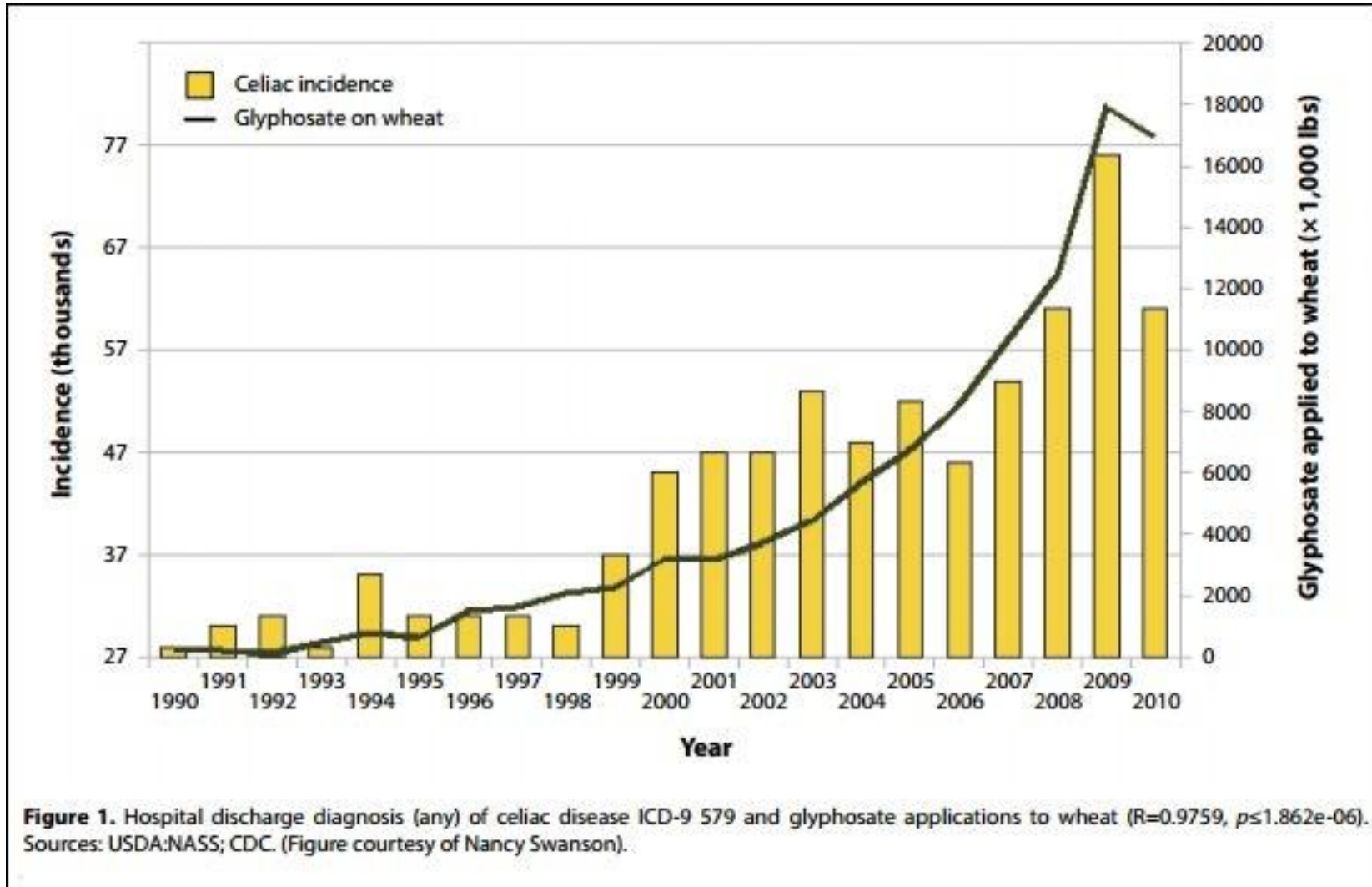


Remember this?
The Problem Isn't GMOs—It's Glyphosate!



Let's look at the health Issues
that have been correlated with glyphosate use . . .

Glyphosate Exposure Health Correlation – Celiac's

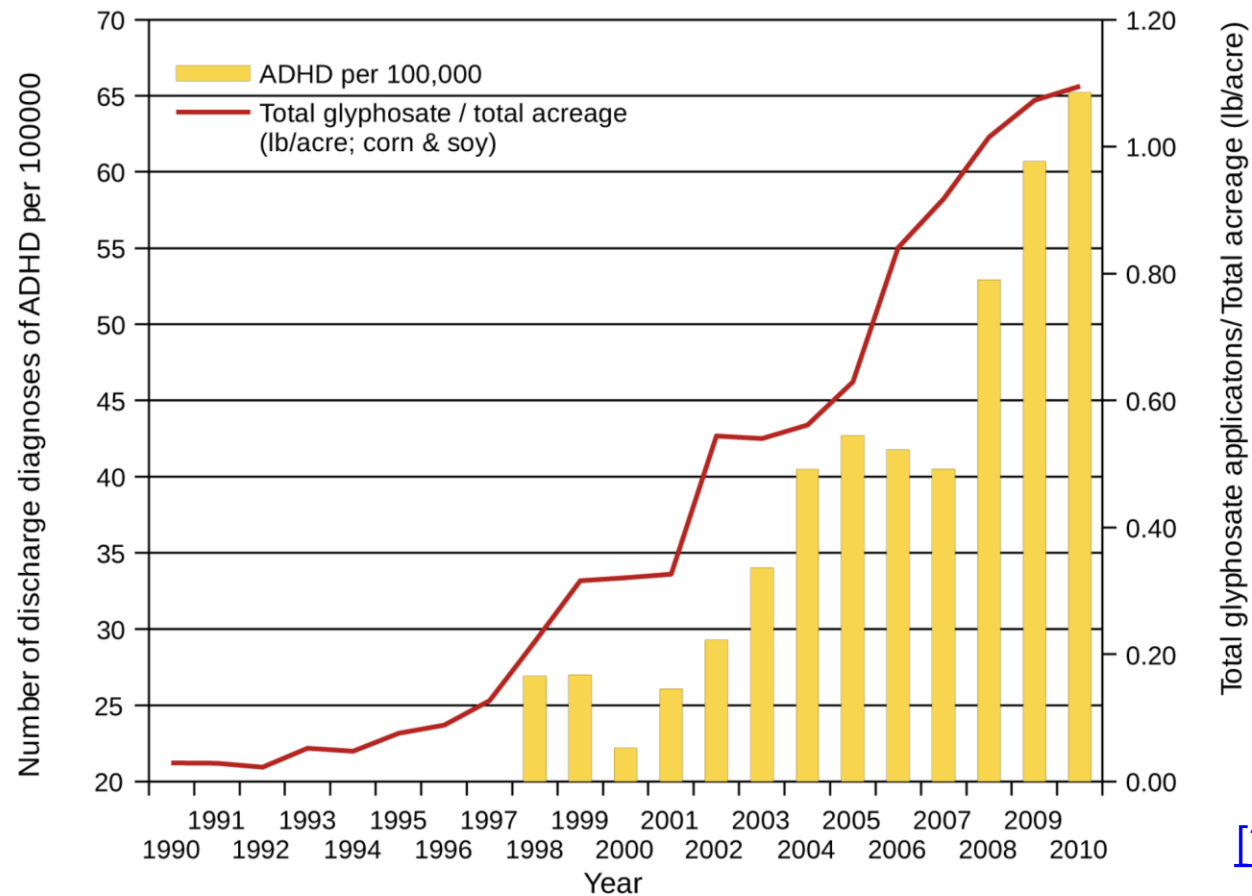


Glyphosate Exposure Health Correlation – ADHD

Hospital Discharge Diagnoses of ADHD (ICD 314.00-01)
& Glyphosate applied to corn & soy crops

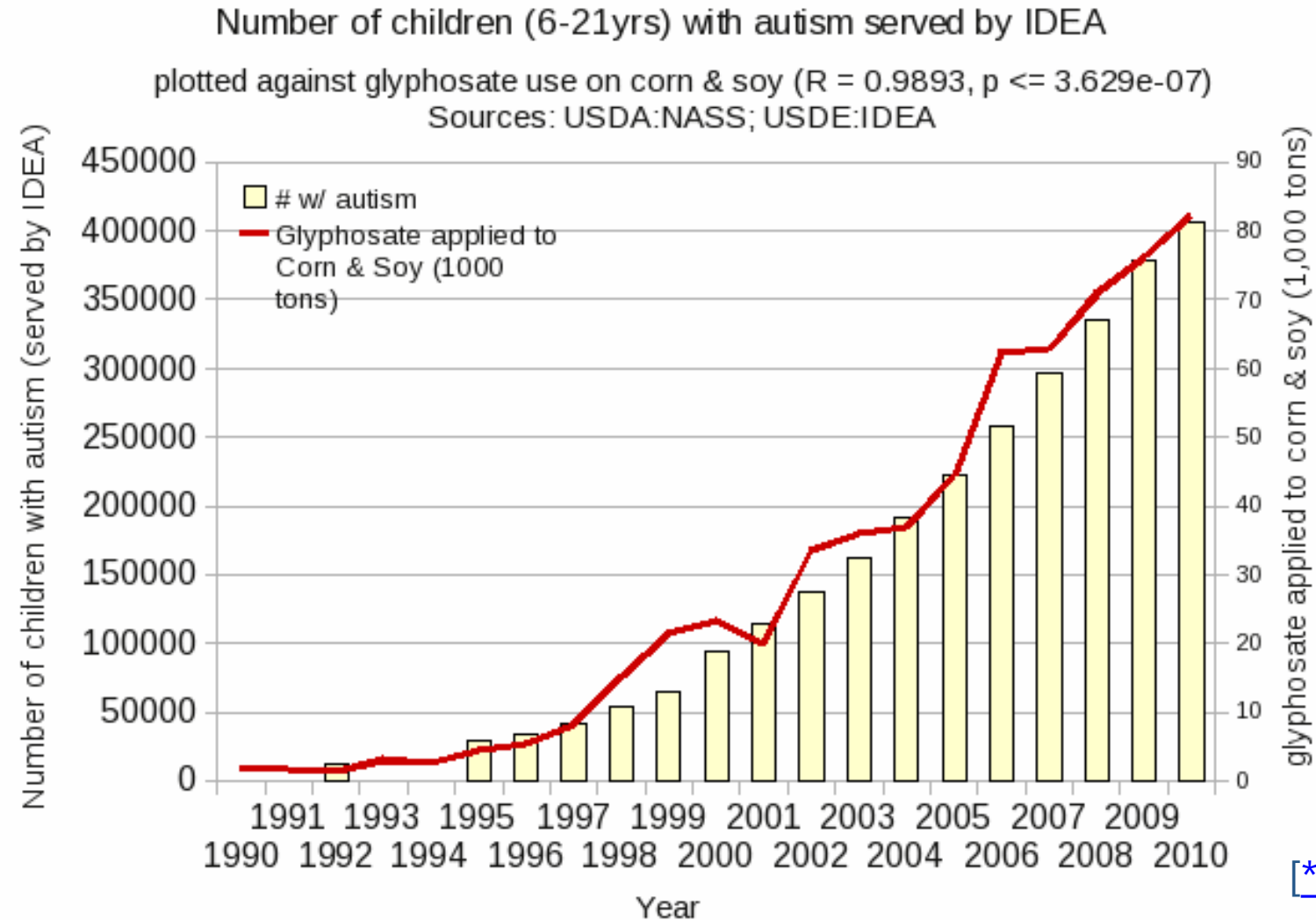
$R = 0.9466$, $p \leq 3.632e-05$

Sources: CDC; USDA



[*]

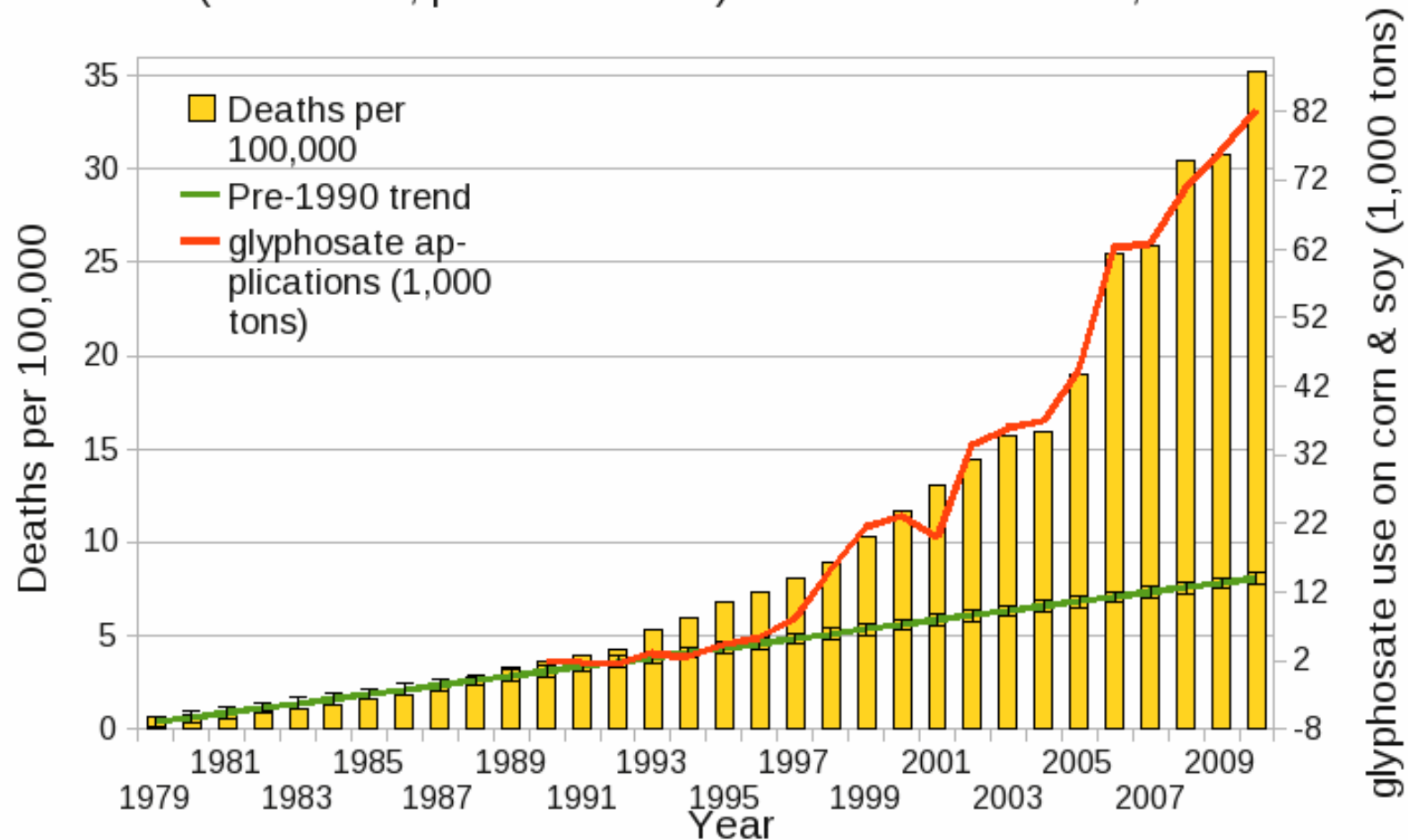
Glyphosate Exposure Health Correlation - Autism



[*]

Glyphosate Exposure Health Correlation - Dementia

Deaths from Senile Dementia (ICD F01, F03 & 290)
plotted against glyphosate applications on corn & soy
($R = 0.9933$, $p \leq 1.947e-09$) sources: USDA:NASS; CDC

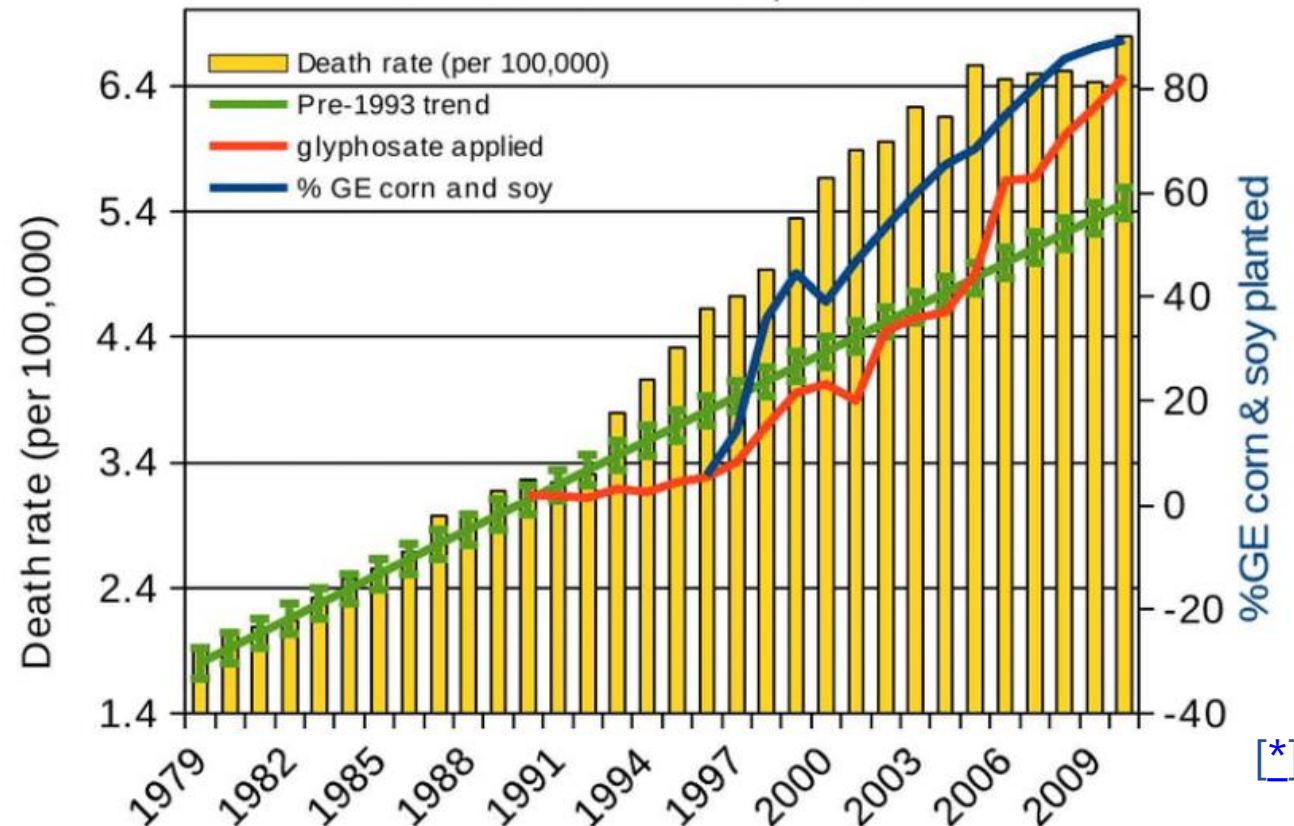


[*]

Glyphosate Exposure Health Correlation – Parkinson's

Age Adjusted Deaths from Parkinson's disease (ICD G20 & 332.0)

plotted against glyphosate use on corn & soy ($R = 0.8754$, $p \leq 1.631e-06$)
and percent GE corn & soy planted ($R = 0.9516$, $p \leq 5.398e-06$)
sources: USDA:NASS; CDC

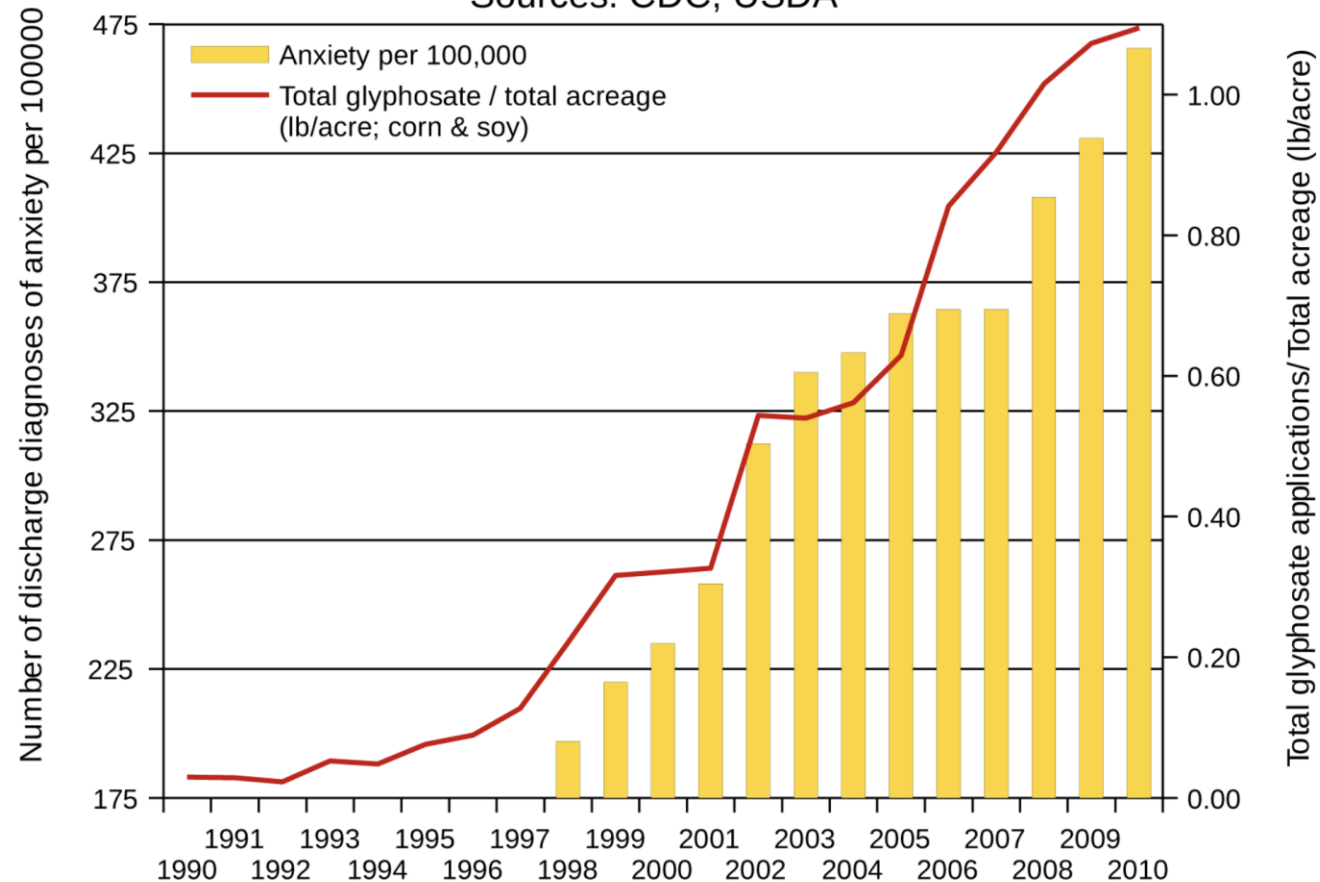


Glyphosate Exposure Health Correlation - Anxiety

Hospital Discharge Diagnoses of Anxiety (ICD 300)
& Glyphosate applied to corn & soy crops

$R = 0.95$, $p \leq 3.231e-05$

Sources: CDC; USDA



[*]

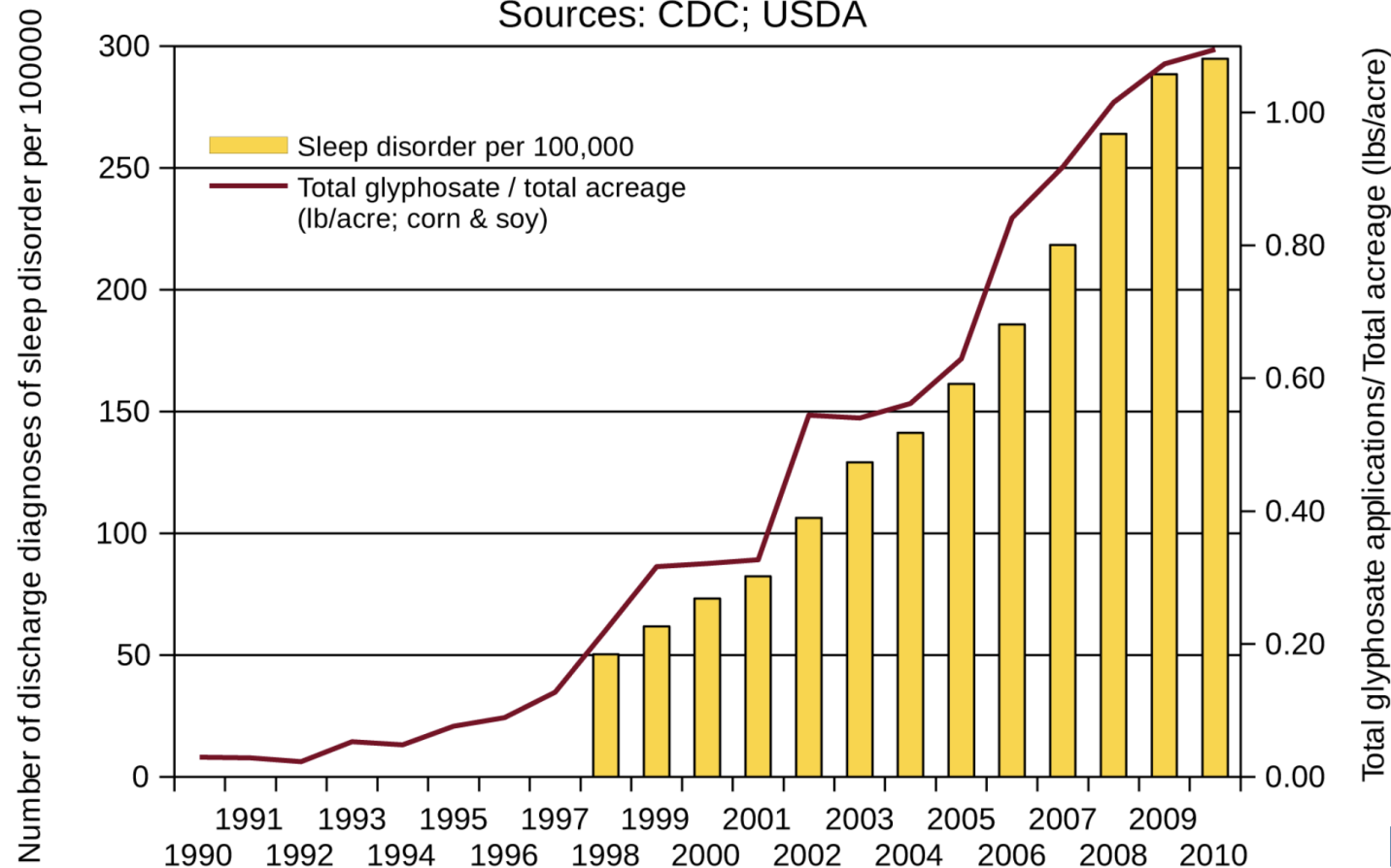
Glyphosate Exposure Health Correlation – Sleep Issues

Hospital Discharge Diagnoses of Sleep Disorders
(ICD 327, 780.50-59, 307.41-49)

& Glyphosate applied to corn & soy crops

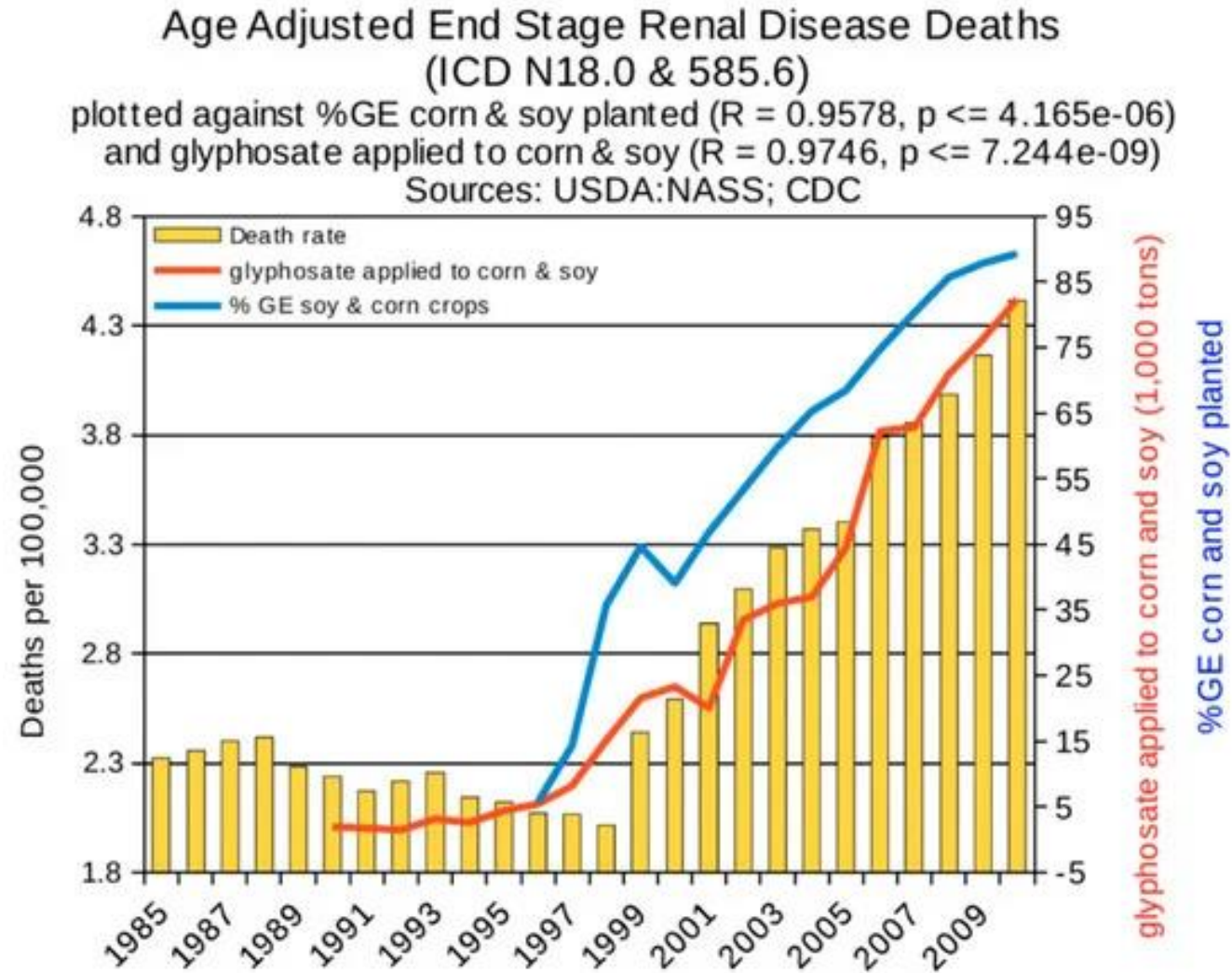
$R = 0.9876$, $p < 7.744 \times 10^{-6}$

Sources: CDC; USDA



[*]

Glyphosate Exposure Health Correlation – Renal Failure



[*]

Glyphosate Lawsuits

As of 2020, the makers of glyphosate have paid more than \$10 billion in damages over legal claims that glyphosate causes cancer—specifically Non-Hodgkins lymphoma.

- **2018: Dewayne Johnson**, a school groundskeeper, was awarded **\$21.5 million**. He argued that glyphosate exposure caused his terminal non-Hodgkins lymphoma. [✖]
- **2019: Edwin Hardeman** awarded **\$26 million** for glyphosate's "substantial role" in causing his non-Hodgkins lymphoma. Vince Chhabria, the judge, concluded that glyphosate's producer "was more concerned with tamping down safety inquiries and manipulating public opinion than it was with ensuring its product is safe." [✖]
- **2019: Alva and Alberta Pilliod**, a husband and wife, were awarded **\$86.7 million** after a court determined that glyphosate contributed to both of them getting non-Hodgkins lymphoma. [✖]
- **2019:** Emails released in court found that glyphosate's producers were discussing ways to **manipulate safety trials**, to make the results appear more legitimate. The judge stated that glyphosate's producer showed "a lack of concern about the risk that its product might be carcinogenic." [✖]
- **2020:** Glyphosate's producer agreed to pay out **\$10 billion** in damages to settle **numerous class-action lawsuits** alleging that glyphosate causes non-Hodgkins lymphoma. [✖]

Glyphosate Has Become a Systemic Issue

A 2014-15 study by the Centers for Disease Control and Prevention found glyphosate in more than 80% of U.S. urine samples. [*]

A 2022 study found glyphosate in 99% of French urine samples. The study included 6848 people. [*]

According to a 2020 USGS Report, glyphosate is prevalent in North American rivers and streams[*]



A close-up photograph of a person's hand holding a green and yellow spray bottle, dispensing a fine mist of liquid onto a lush green lawn. Several yellow dandelion flowers are visible in the foreground, some of which are being sprayed. The background is a soft-focus green field under bright sunlight. The text "We are all experiencing glyphosate exposure" is overlaid in white on the right side of the image.

We are all experiencing
glyphosate exposure

What Can We Do?

And how you can help your patients?

Remediation with
Humic and
Fulvic
Substances



Glyphosate
Testing for food
and Humans



The Non-GMO Project

How effective is it, really?

- The Non-GMO project is a great start! You should definitely look for that when food shopping.
- The challenge is that the governance on food labeling for Non-GMO is not well funded or managed.
- Like “Organic”, you can’t necessarily be assured that processed food which has some sort of Non-GMO marking is completely Non-GMO



Glyphosate Testing

How to get it done



The Great Plains Laboratory, Inc.

Urine Lab Tests (Sent to the lab):
For determining human toxicity level.



Green Piece Instant Test (In-home):
Easy to Use Strips Fast and Accurate Home
Water Test Kit for Water and Food (Corn,
Wheat, Beer, Honey, Cereals, Whole Oats,
Soybeans, Soil etc.)



Tests (Done in your office):
For determining human toxicity level.



Soil Testing (Sent to the lab):
Rx Soil Herbicide Package Screening for
soils and agriculture.



Plant-Based Mineral Substances

They offer:

- Glyphosate remediation
- Glyphosate removal
- Full-system detoxification
- Full-spectrum trace mineral replenishment

What Are Plant-Based Minerals?



Decomposed Fresh Water Plants

An Entire Rain Forest Decomposed over Millennia



Becoming a Single Stratum of Earth Called . . .

Humate

Inside Humate



Humic



Fulvic

Powerful Support for Glyphosate
Remediation & Detoxification

Fulvic Molecule – An Intercellular Vehicle

Is smaller than a cell

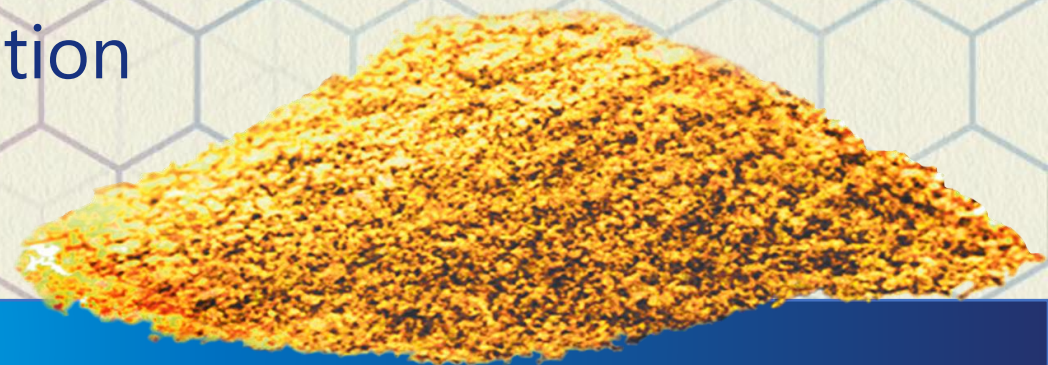
Is a strong electrolyte

Is a powerful flavonoid

Is a chelator

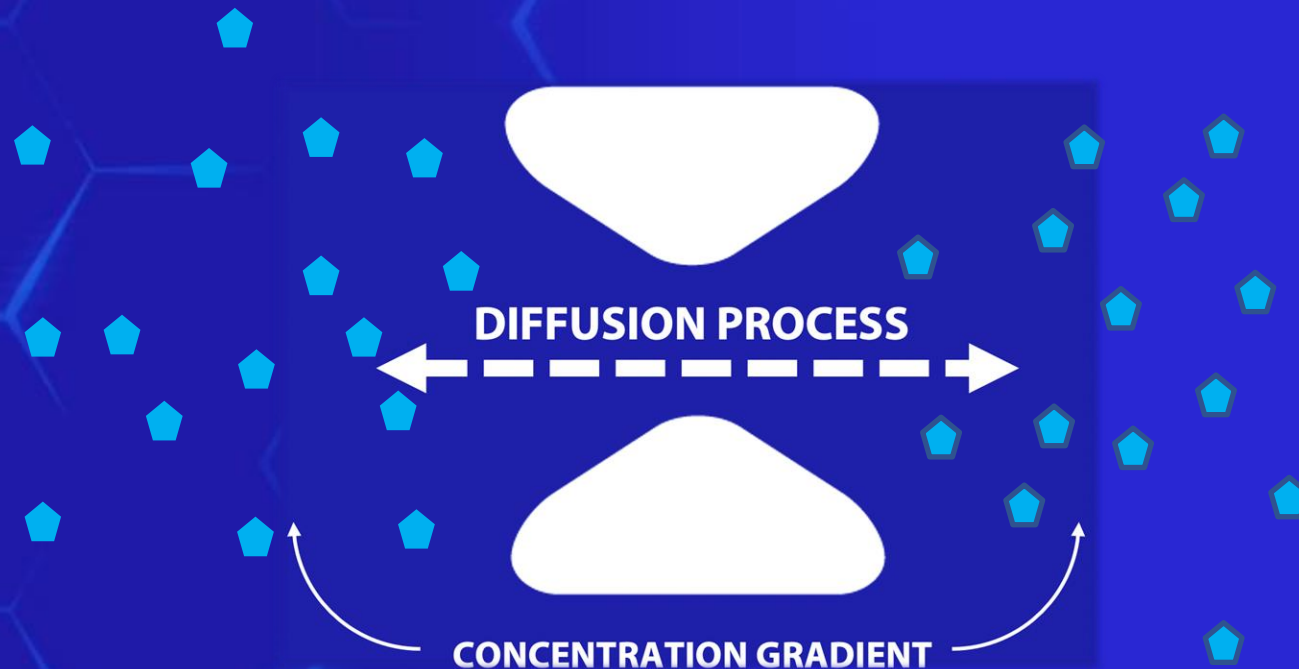
Enhances cellular waste removal

Provides intercellular glyphosate remediation



Fulvic Flavonoid Capacity

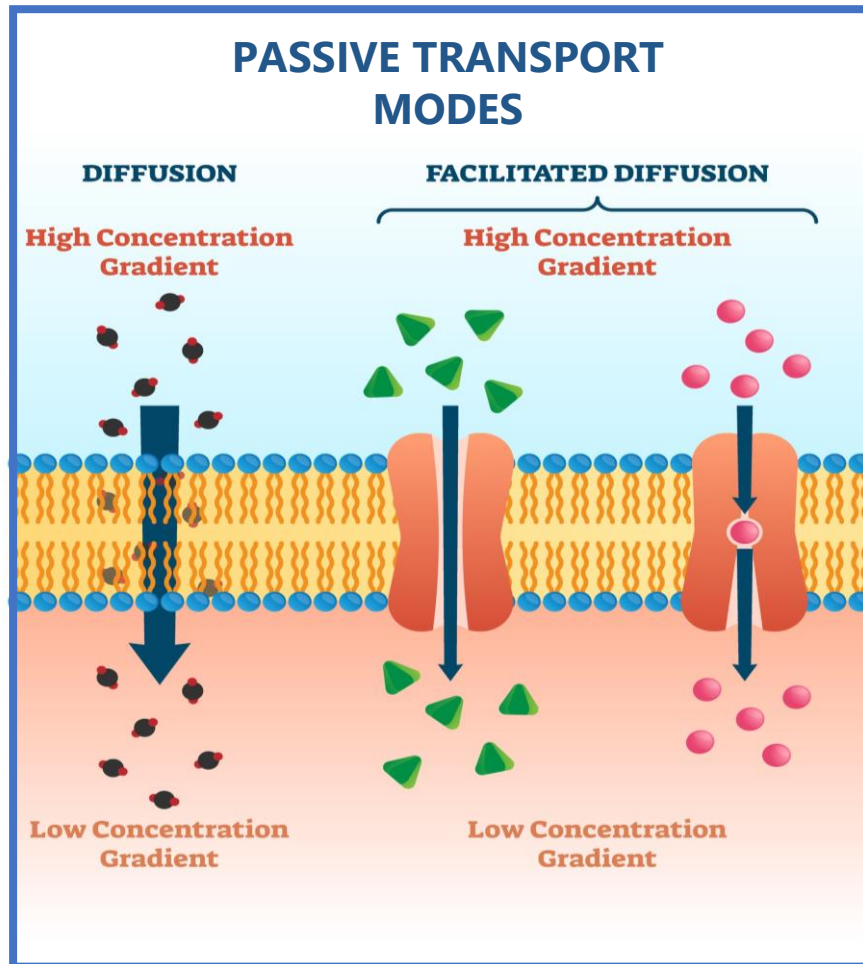
How does it work?



1. Because of the law of the *concentration gradient* in liquid systems, elements move (via diffusion) into and out the cells
2. The system is in a constant process of balancing the concentration of elements inside and outside of the cells.

How Fulvic Supports Glyphosate Removal

Provides ACTIVE-Transport for Toxins out of the Cells



1. The Fulvic molecule enhances passive intercellular transport via "Facilitated Diffusion" also called "Co-Transport".
2. The Fulvic molecule can change its polarity, enabling it to carry bio-waste and toxins out of the cell... which means -- *out of the tissue*.
3. This is how it provides detoxification support and removes Glyphosate from tissues.

Humic Molecule – Nature's Janitor

Is Much larger than a cell

Is Extracellular

Is a Strong Electrolyte

Promotes cell wall permeability

Is a Full System Detoxifier

Is a Powerful chelator & antioxidant

Adsorbs Glyphosates!!!

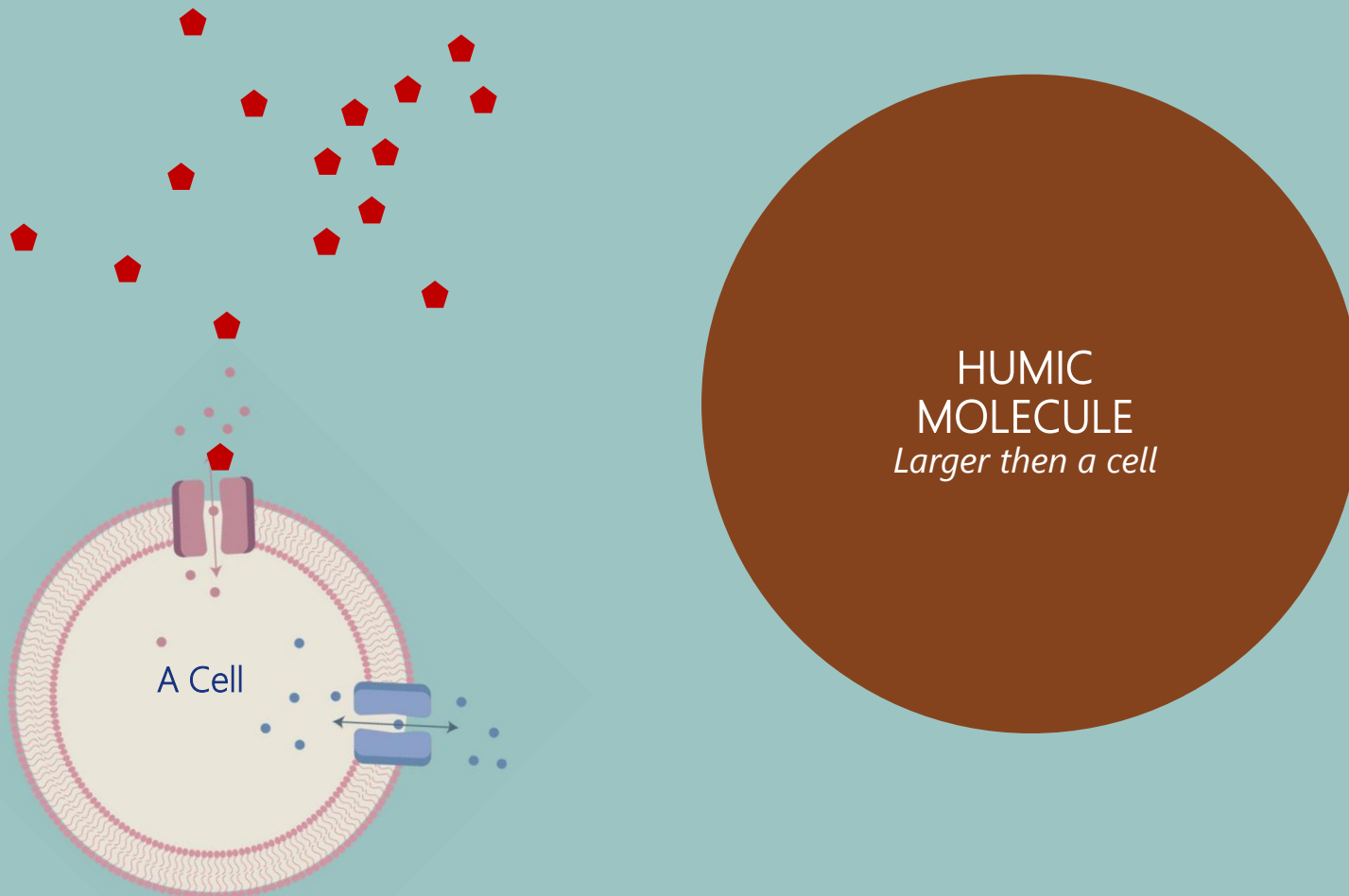


How Humic Remediation Works

Three Powerful Capacities

1. Binds to glyphosate
2. Adsorbs glyphosate
3. Speeds glyphosate breakdown

Glyphosate Remediation Power of Humic



1. You ingest glyphosate and it absorbs into your bloodstream via your gut.
2. You ingest humic and it also absorbs into our bloodstream via your gut.
3. Humic *adsorbs* the glyphosate:
 - Remediating the glyphosate while it's in your system.
 - Keeping it from being absorbed into your tissues (your cells)

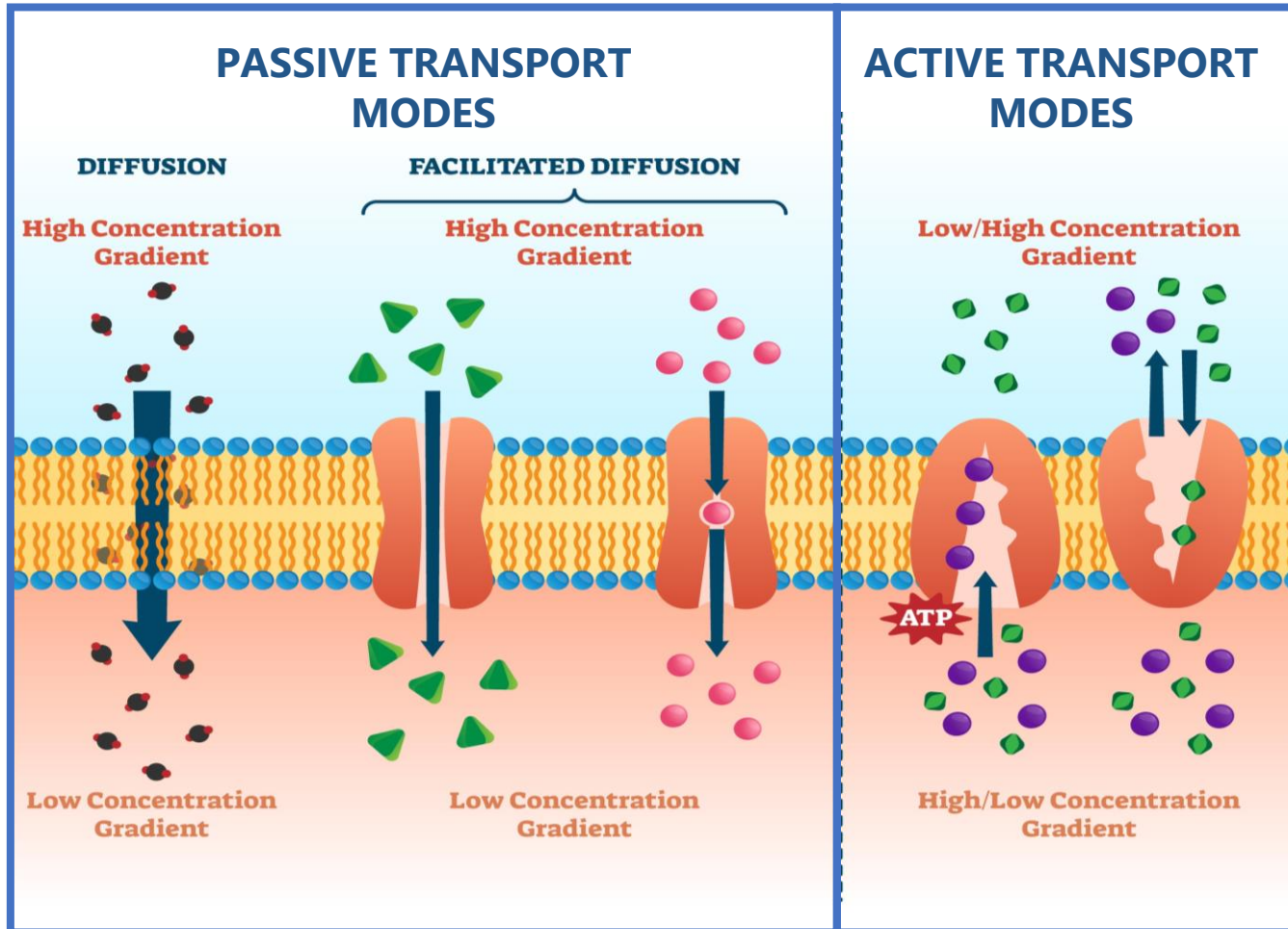
Detoxification Power of the Humic Molecule

Three MORE Capacities

1. Enhances cell wall permeability
2. Provides intercellular detoxification
3. Supports full-system detoxification

Humic Supports Interacellular Glyphosate Detoxification

Increases Cell Wall Permeability - Provides ACTIVE-transport

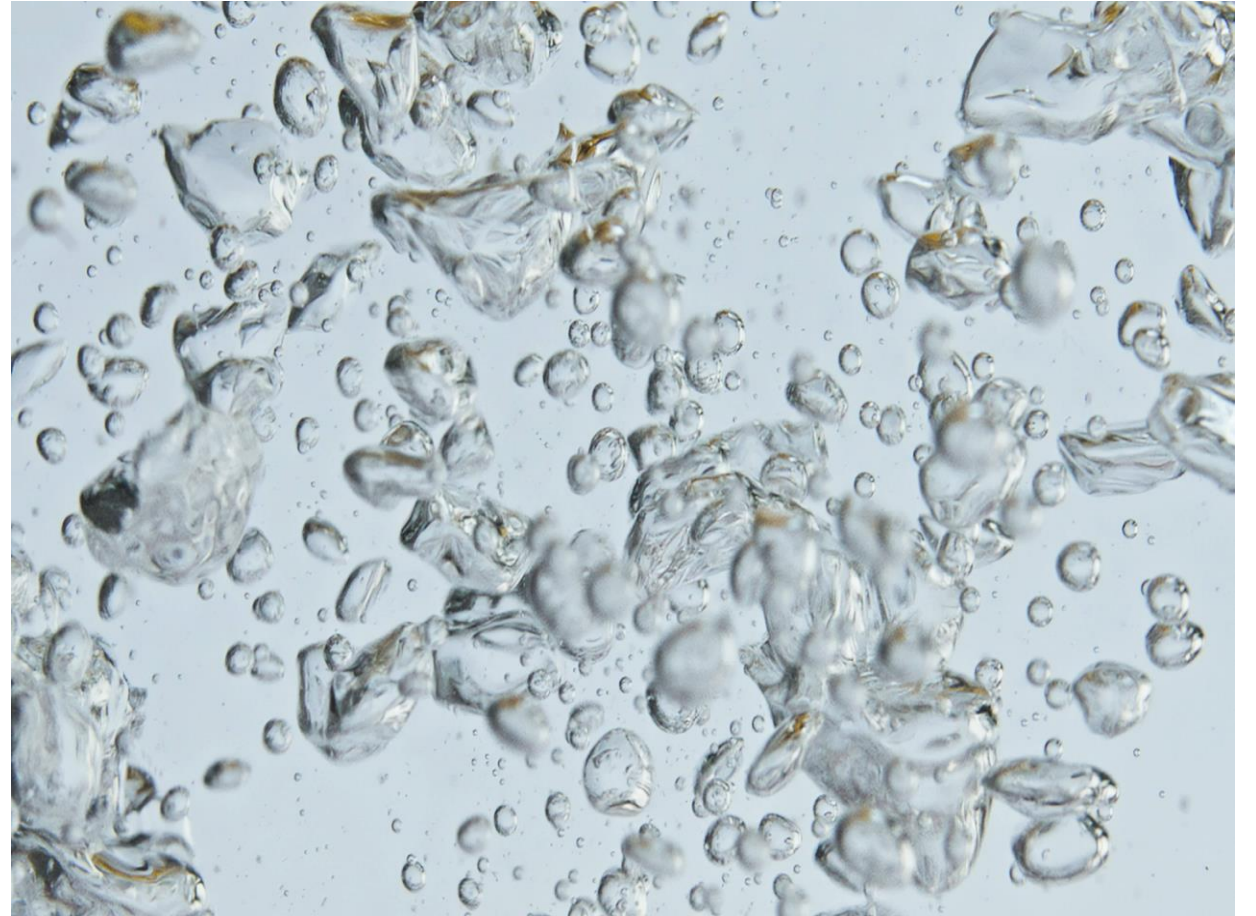


1. The Humic molecule enables an "Active Transport" mode.
2. It does this by interacting with proteins in the cell wall, which open more channels in the cell membrane.
3. This enhances intercellular transport, because transport doesn't rely completely on concentration gradient balance.

Humic Supports Full-System Glyphosate Detoxification

A 2-Step Process

- 1. Binding:** The humic molecule adsorbs the glyphosate molecule, binding with it, so that it can no longer roam free in the body.
- 2. Removal:** Then the humic molecule falls out of solution and leaves the body through the normal elimination channels (breathe, sweat, tears, urine, feces, skin, hair, nails, etc.)





How do We Know That
Humic and Fulvic Actually Work?

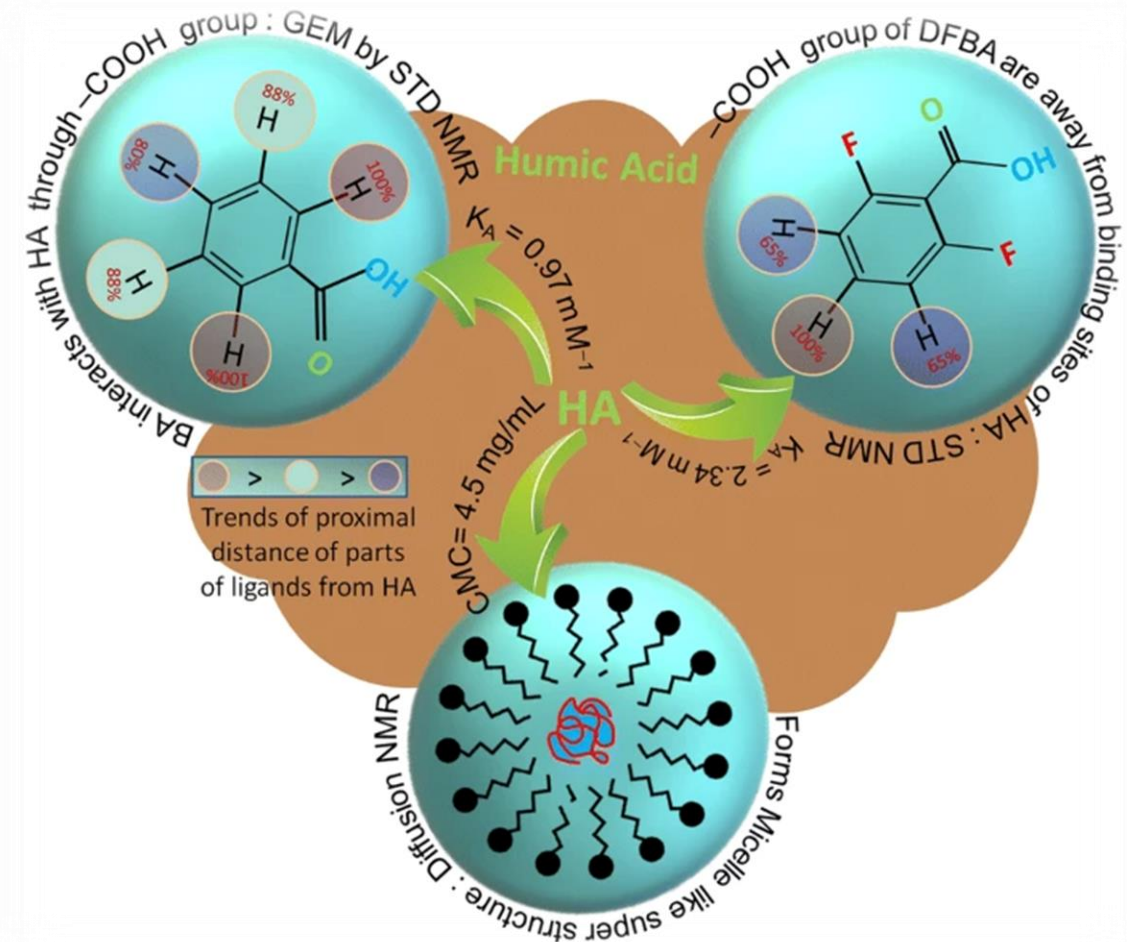
Let's look at the Studies . . .



STUDY

Humic Nullifies Glyphosate Anti-Microbial Effect

2021 study shows that interactions between dissolved humic and the glyphosate molecule renders the glyphosate molecule unable to have its antimicrobial or chelating effects. [*]



STUDY

2014 Chicken Study

- Chicken feed is glyphosate ridden
- Chickens fed humic with their feed
- Chickens exhibited better health
- Chickens showed better growth
- Control group showed marked glyphosate reduction: [[*\]](#)
 - 56% reduction in GI tract
 - 63% reduction in kidneys
 - 28% reduction in liver





STUDY

Multiple Pig Studies

- Pigs had fewer wounds and wounds healed more quickly
- Pigs were healthier overall
- Pigs finished with a higher weight
- Farmers noted reduced ammonia emissions from pig manure

[*] [*] [*]



STUDIES

2014 Study with Dairy Cows

- Reduced incidence of chronic botulism associated with glyphosate toxicity [[*\]](#)
- Positively affected gut health
- Increased blood mineral values
- Lactation output increased

Summary

- Glyphosate (Roundup) is the most popular agricultural pesticide in the world.
- Roundup-Ready GMO crops were designed to survive extreme glyphosate levels, allowing for increased pesticide use on farms.
- As a result, glyphosate use has skyrocketed: >100x increase from 1974 to 2023.
- Glyphosate, mixed with adjuvants and surfactants disrupts human gut bacteria and mineral stores, promoting accumulation of environmental toxins.
- As of 2020, glyphosate's producer has paid more than \$10 billion in damages for glyphosate-correlated illness.
- Glyphosate has leached into our water, air, food.
- 80% of American urine samples contain glyphosate.
- Humic and Fulvic provide natural remediation and detoxification of glyphosate.

Glyphosate Remediation with BEAM Minerals

The Multi-Mineral Solution

Your body contains approximately 100 different types of minerals, but most people are deficient or imbalanced, leading to symptoms like brain fog, lethargy, irregular sleep patterns, and even reduced sex drive. Yet, mineral supplementation remains neglected - mostly because people don't realize how easy it is.

Finally, someone is talking about mineral replenishment!

Containing each of the minerals the body needs for optimal function, BEAM Minerals restores cellular energy, allowing the body to gain and maintain healthy balance.

[Learn More](#)



BEAM
MINERALS



Next Generation Hydration

ELECTROLYZE™

BOOSTS ENERGY

INCREASES ENDURANCE

RELIEVES CRAMPS



ELECTROLYZE™

ELECTROLYZE™ is made of fulvic mineral complexes, that are a result of decomposed, fresh-water plants. Fulvic complexes are flavonoids and provide important transportation for nutrients into and bio-waste out of the cells.

Delivered in a proprietary ionized format, ELECTROLYZE™ provides 100% bioavailable, full-spectrum replenishment of electrolytes. With 70+ electrolytes, minerals, phytonutrients and amino acids, ELECTROLYZE™ is the Gold Standard for electrolyte replenishment.

ELECTROLYZE™ has a golden color and tastes like fresh water.

BENEFITS:

For Nutrition	For Athletes	For Women	For Seniors
<ul style="list-style-type: none">• Restores electrolyte balance• Curbs sugar cravings• Optimizes nutrient uptake• Aids healthy gut microbiome• Activates metabolism• Dispels electrolyte depletion symptoms• Reduces fatigue• Detoxes the cells	<ul style="list-style-type: none">• Provides Immediate electrolyte boost• Supports hydration• Contributes to muscle adaptation• Restores system balance after intense exertion• Optimizes nutrient uptake• Removes cellular waste• Supports endurance	<ul style="list-style-type: none">• Supports hydration• Curbs sugar cravings• Promotes healthy gut microbiome• Promotes restful sleep• Reduces fatigue• Supports healthy alkalinity levels• Supports the reduction of inflammation	<ul style="list-style-type: none">• Supports hydration• Increases nutrition uptake• Maintains healthy electrolyte balance• Encourages restful sleep• Promotes cellular detoxification• Provides energy for cellular processes that support cognition• Supports inflammation reduction



MICRO-BOOST™
Complete Mineral Supplement

BOOSTS IMMUNITY | SUPPORTS GUT HEALTH | IMPROVES SLEEP



MICRO-BOOST™

Micro-BOOST™ is made from naturally occurring humic and fulvic minerals, that provide a full-spectrum of micronutrients, trace elements, phytonutrients, amino acids and vitamins.

Humic mineral complexes are the champion of antioxidants! They collect free radicals and bio-waste, bind with heavy metals and provide important detoxification support by carrying these unwanted elements out of the body.

Micro-BOOST™ has a deep rich hue, similar to a cup of coffee or dark tea, yet the flavor is surprisingly mild and pleasant.

Provides Support for:

For Nutrition	Athletes	Women	For Seniors
<ul style="list-style-type: none">• Enhances system detoxification• Replenishes Micronutrients• Supports healthy gut microbiome• Provides full-spectrum electrolytes• Supports nervous system• Provides optimal low carb diet supplementation• Won't break a fast	<ul style="list-style-type: none">• Relieves chronic muscle cramps• Supports lactic acid removal• Supports healthy muscle adaptation• Provides system balance after intense exertion• Provides full-spectrum electrolytes	<ul style="list-style-type: none">• Provides micronutrient necessary to support hormonal balance• Supports healthy menstruation• Provides minerals to support healthy gestation, birth & lactation.• Provides gentle system detoxification	<ul style="list-style-type: none">• Supports Free radical elimination• Provides cellular system cleanup• Relieves chronic night cramps• Supports Mood management• Provides full-spectrum electrolytes• Supports cognition



INSTA-LYTES™

Electrolyte Misting Spray



SOFTENS CRAMPS | RECHARGES ELECTROLYTES | SOOTHES ACHES



INSTA-LYTES™

INSTA-LYTES™ Electrolyte Misting Spray is made from fulvic mineral complexes that consist of 70+ trace minerals and amino acids. These tiny powerhouses transport nutrients into and bio-waste out of the cells. Delivered in a proprietary, 100% bioavailable, misting spray format, INSTA-LYTES™ provides immediate, local, cellular support.

Just spray it on! The electrolytes in INSTA-LYTES™ start working immediately, recharging the local electrical system, softening cramps, soothing body aches, clearing lactic acid and detoxing the cells.

INSTA-LYTES™ has no scent and is composed of nothing but completely natural fulvic minerals and pure water.

Provides Support for:

For Fasting	Athletes	Women	For Seniors
<ul style="list-style-type: none">• Provides an instant lift during fasting• Relieves body aches• Supports system detoxification• Relieves hydration headaches	<ul style="list-style-type: none">• Relieves Hydration Headaches• Relieves Post workout soreness• Recharges local electrolytes• Supports muscle adaptation• Provides replenishment after intense exertion	<ul style="list-style-type: none">• Relieves Menstrual cramps• Excellent birthing support• Promotes healing of post-birthing wounds• Relieves acute night cramps• Provides skin detoxification after make-up removal• Excellent skin toner	<ul style="list-style-type: none">• Relieves acute cramps• Supports mood management• Provides immediate Electrolyte replenishment• Relieves body aches• Hydrates sinuses and skin• Excellent support for fragile, skin• Promotes healing of abrasions



ELECTRO-BOOST™
Complete Mineral Supplement



**BOOSTS
IMMUNITY**

**SUPPORTS
GUT HEALTH**

**IMPROVES
SLEEP**



ELECTRO-BOOST™

ELECTRO-BOOST™ is a capsule made from naturally occurring humic and fulvic minerals. Gathered directly from the earth, humic and fulvic minerals provide a full-spectrum of micronutrients, trace elements, phytonutrients, amino acids and vitamins.

Humic mineral complexes are the champion of antioxidants! They collect free radicals and bio-waste, bind with heavy metals and provide important detoxification support by carrying these unwanted elements out of the body.

**Electro-Boost™ is completely pure, with absolutely no fillers, binders, excipients, in a vegan capsule.
Provides Support for:**

For Nutrition	Athletes	Women	For Seniors
<ul style="list-style-type: none">• System detoxification• Micronutrient depletion• Healthy gut microbiome• Headaches• Nervous System• Travel	<ul style="list-style-type: none">• Chronic Muscle cramps• Micronutrient depletion• Headaches• Body aches• Healthy muscle adaptation• System balance after intense exertion	<ul style="list-style-type: none">• Supports Healthy Menstruation• Alleviates PMS• Reinforces healthy gut microbiome• Supports Electrolyte balance• Provides cellular support during birthing process	<ul style="list-style-type: none">• Provides electrolyte support• Cellular system cleanup• Relieves chronic night cramps• Provides support for mood management• Supports aging skin, hair and nails• Supports healthy

QUESTIONS?

