“Living Soil”—The Secret to Healthy Food and Healthy You

(The Green Hills Farm Project)

GHFP Schedule

- 0900-0950: Part 1—Health & Soil
- 1000-1050: Part 2—Soil Deeper Dive
- 1:00-1:50: Part 3—Application Examples
- 2:00+: Q&A

HUGE Topic!!!

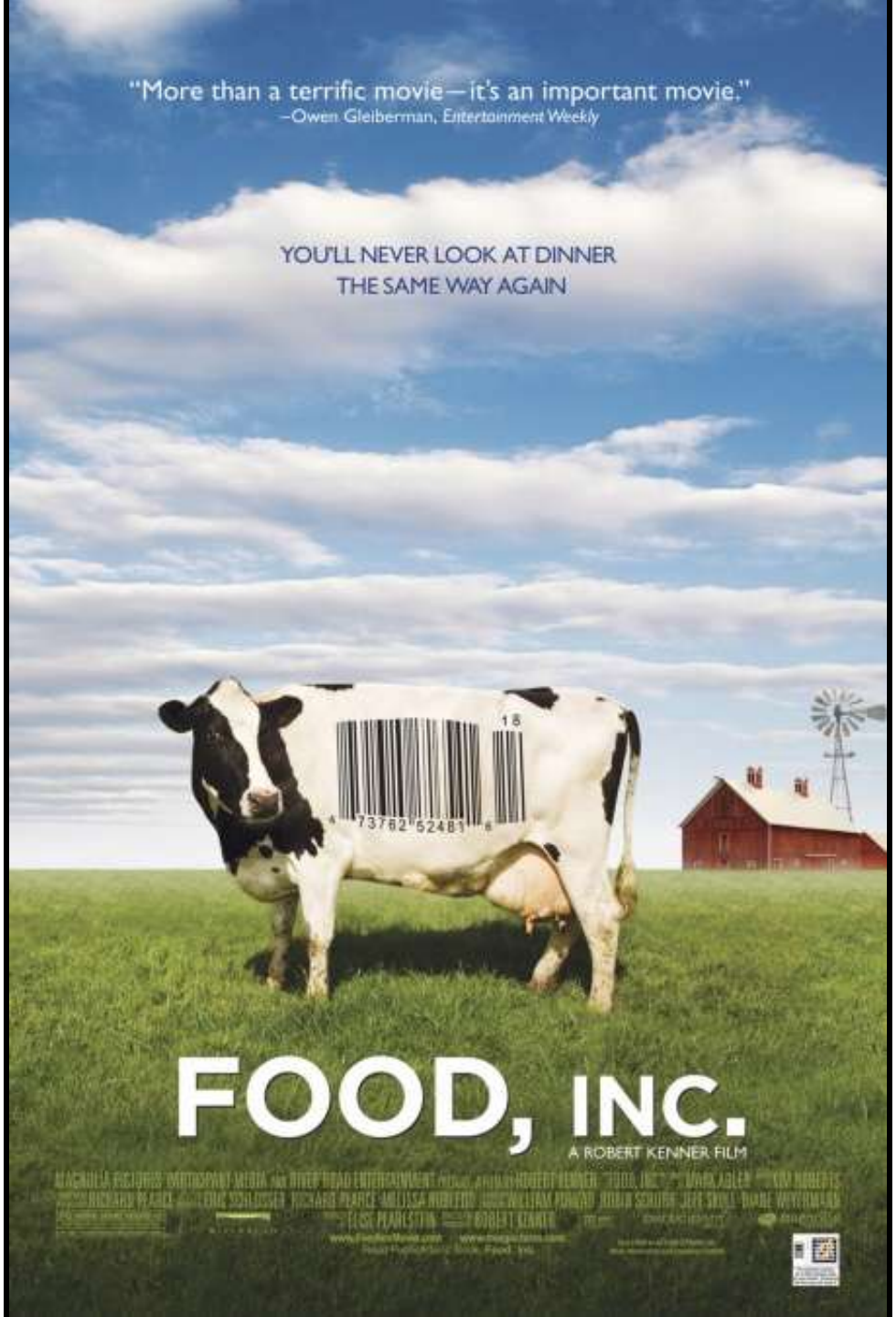
- www.Libertytracefarm.com
- References “Books and Resources” Tab
- These Slides “Living Soil” Tab
- Links Past Presentations (2024)
  - (Beginner & Advanced)

Objectives—Part 1

- Human Health
- Soil
- Dirt vs Soil

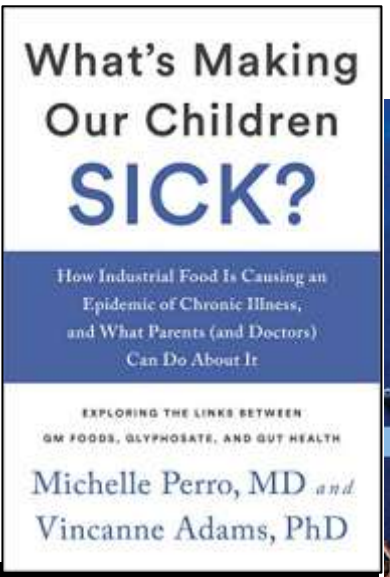
30 YEARS (1985-2015)

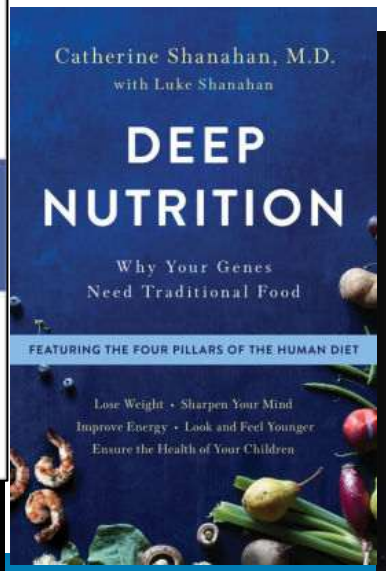
- Degrees in Electrical Engineering
- Technology solves problems!

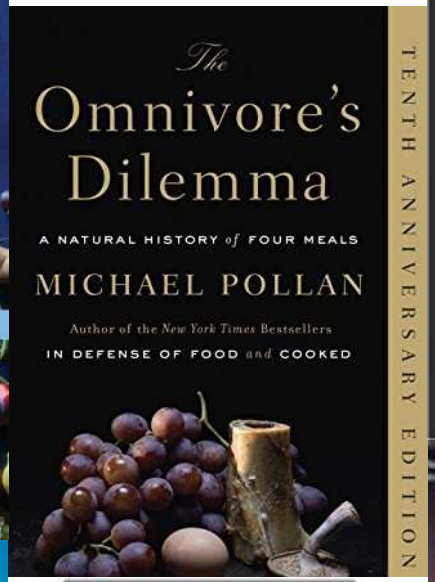

"More than a terrific movie—it's an important movie."
–Owen Gleiberman, Entertainment Weekly
YOU'LL NEVER LOOK AT DINNER
THE SAME WAY AGAIN
FOOD, INC.
A ROBERT KENNER FILM

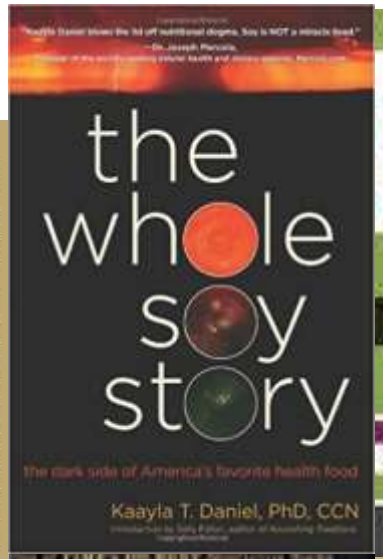
Joel Salatin—Polyface Farm

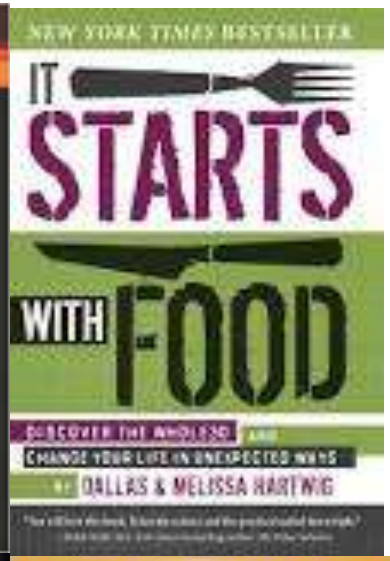
2008 and Every Day Since…

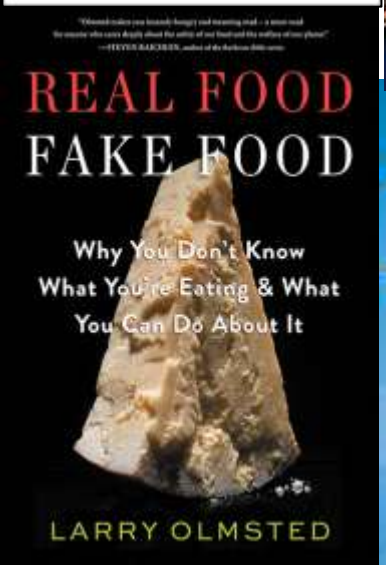


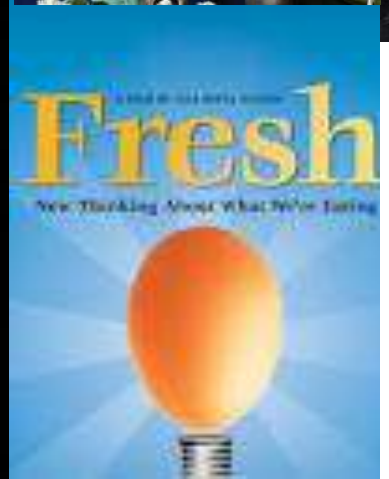


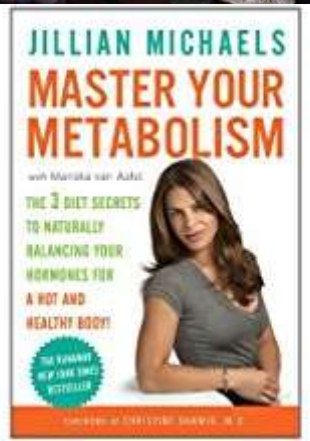


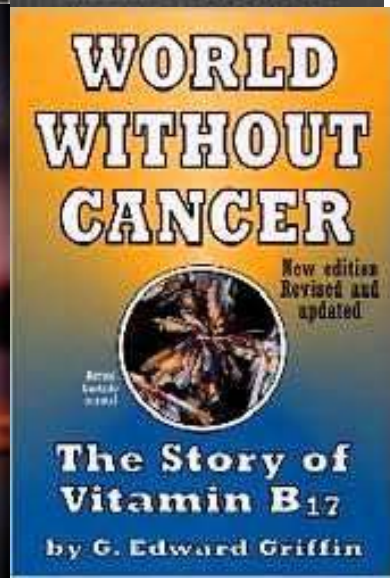




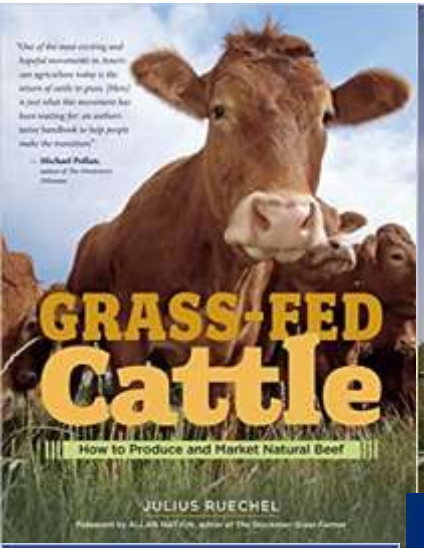


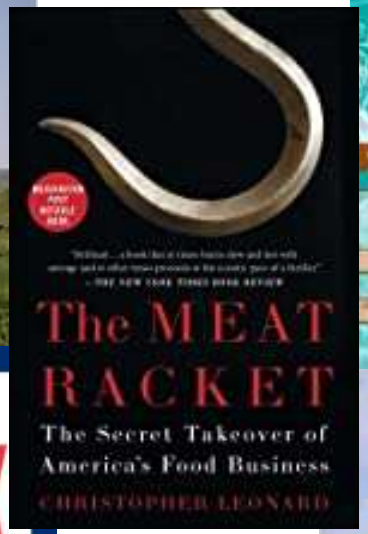


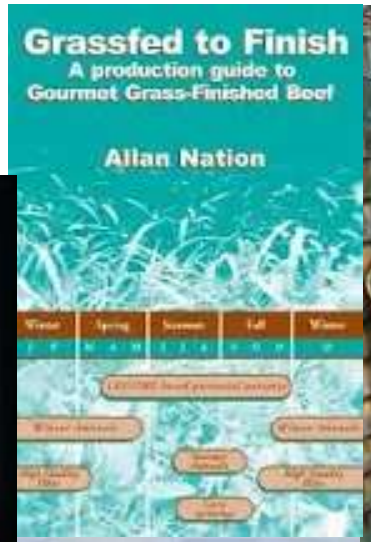


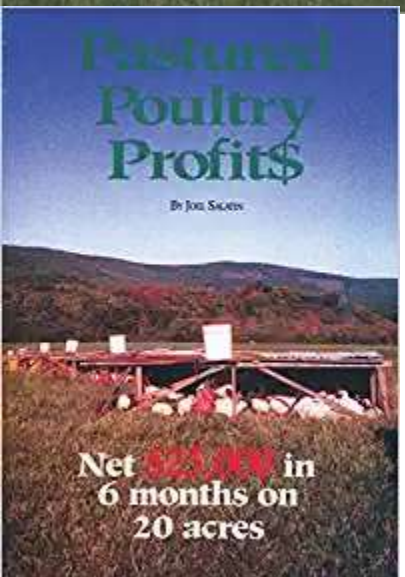


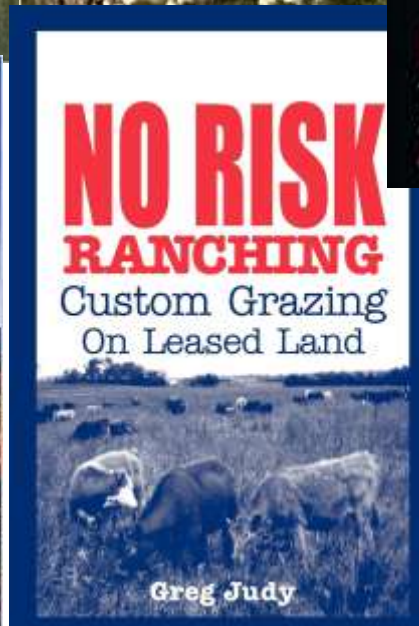
Let's Start a Farm!

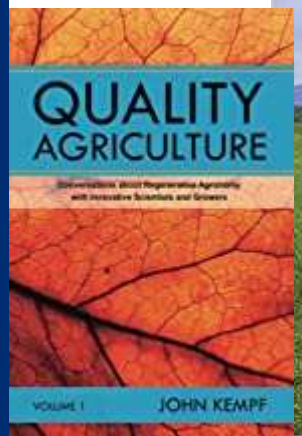


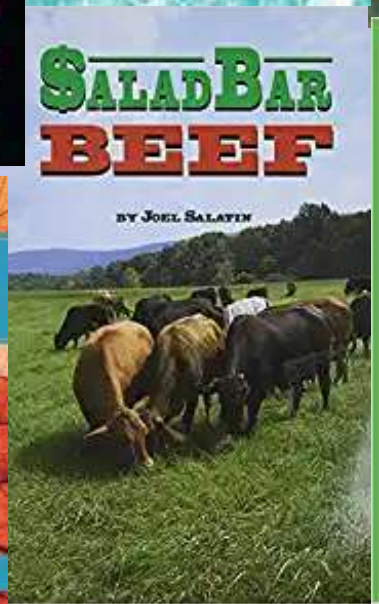


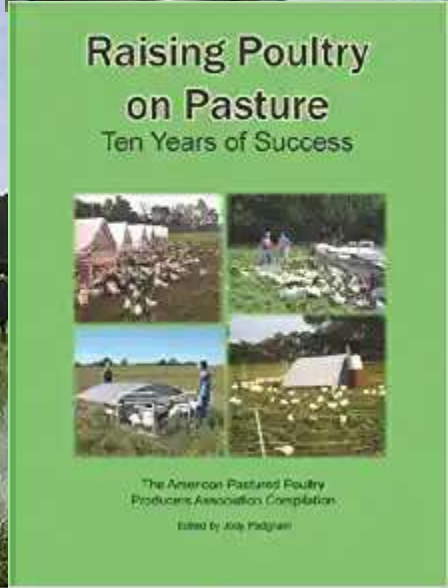












Hmmm…"Blinders" Came Off!

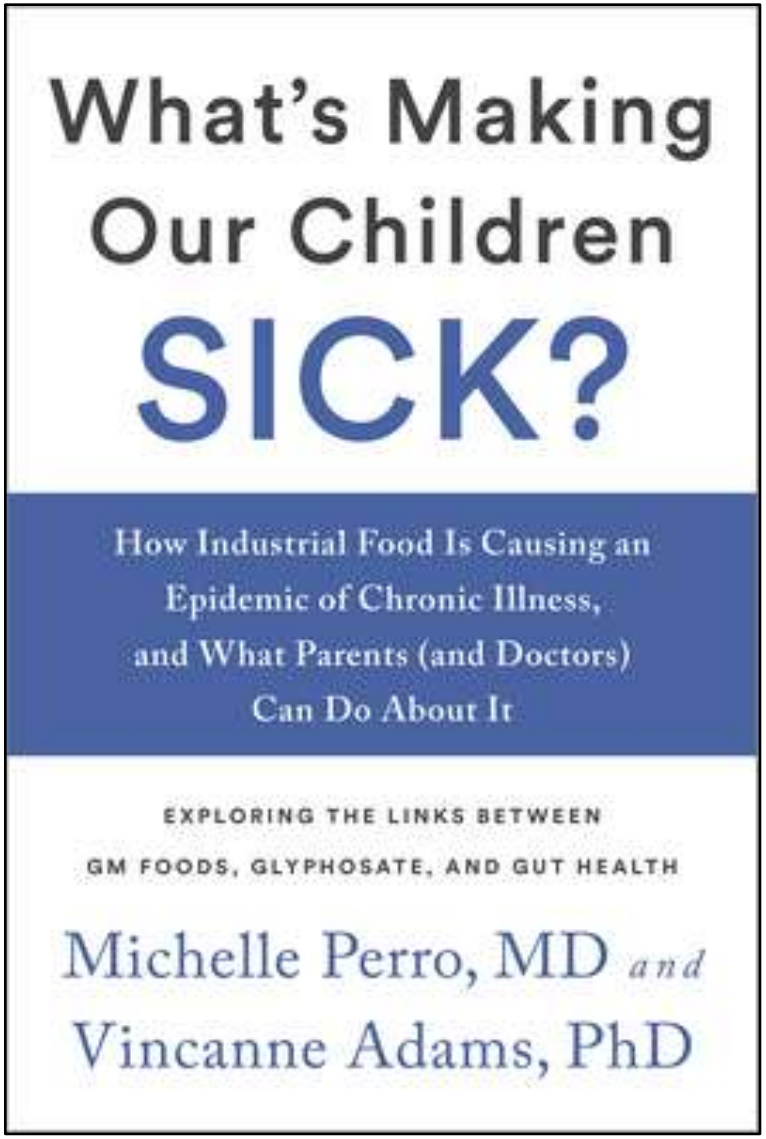
- "Diseases" never heard of as a kid
  - Obesity, Autism, Alzheimers, Parkinsons, Dementia, Diabetes, Cancer, Leaky Gut Syndrome, Irritable Bowel Syndrome, Celiac, Crohn's, Autoimmune Illnesses, Restless Leg Syndrome, Chronic Dry Eye, etc, etc.
- 50% Pharmaceutical Ads
  - "Talk to my doctor about this drug"

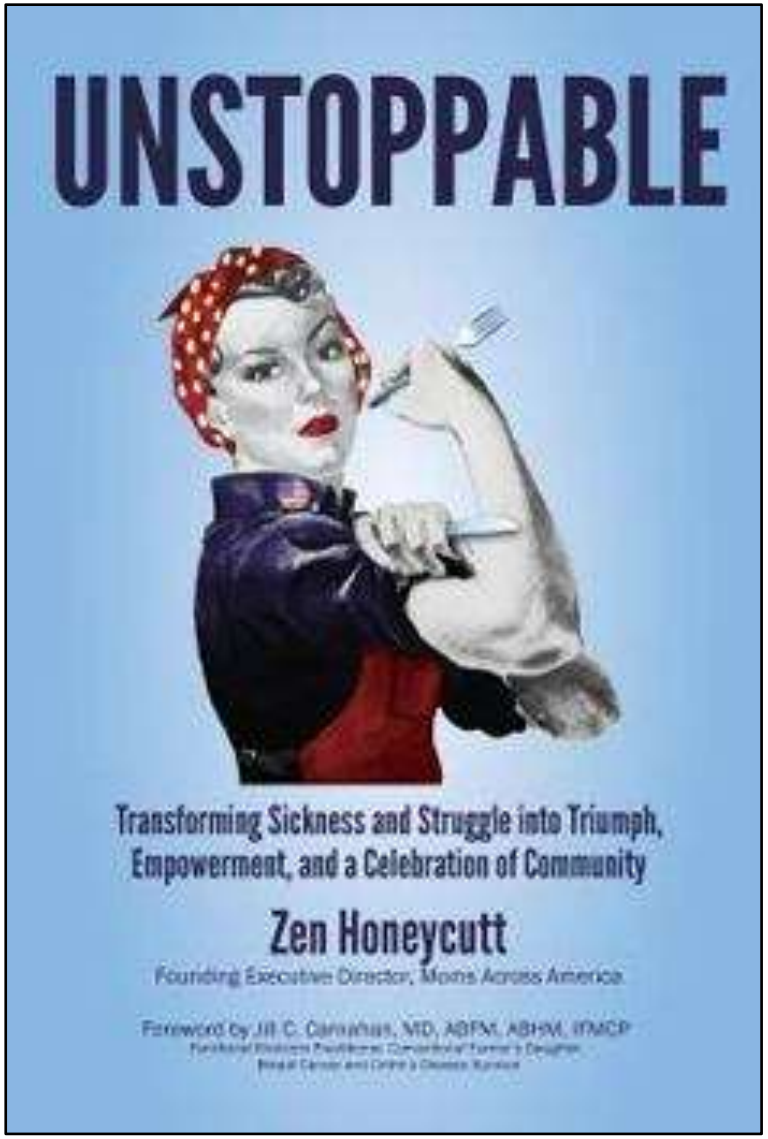
We're Not Healthy

- 2017: 75% of our youth 17-24 unqualified to join military
- 1965: 4% of our population had a chronic disease
  - Today 46% of our children have a chronic disease
- 2006: MS only state above 30% obesity--today 41 states
- US spent $5.3 Trillion on healthcare in 2024
  - We spent $3.65 Trillion in 2018 (+45%)
  - 6x times Defense Budget ($962 Billion in 2025)
  - We spent $6 Trillion on WWII (2024 dollars)

- What's a Trillion?? ($1M/day how long?)

What's Going On????





MOMS ACROSS AMERICA

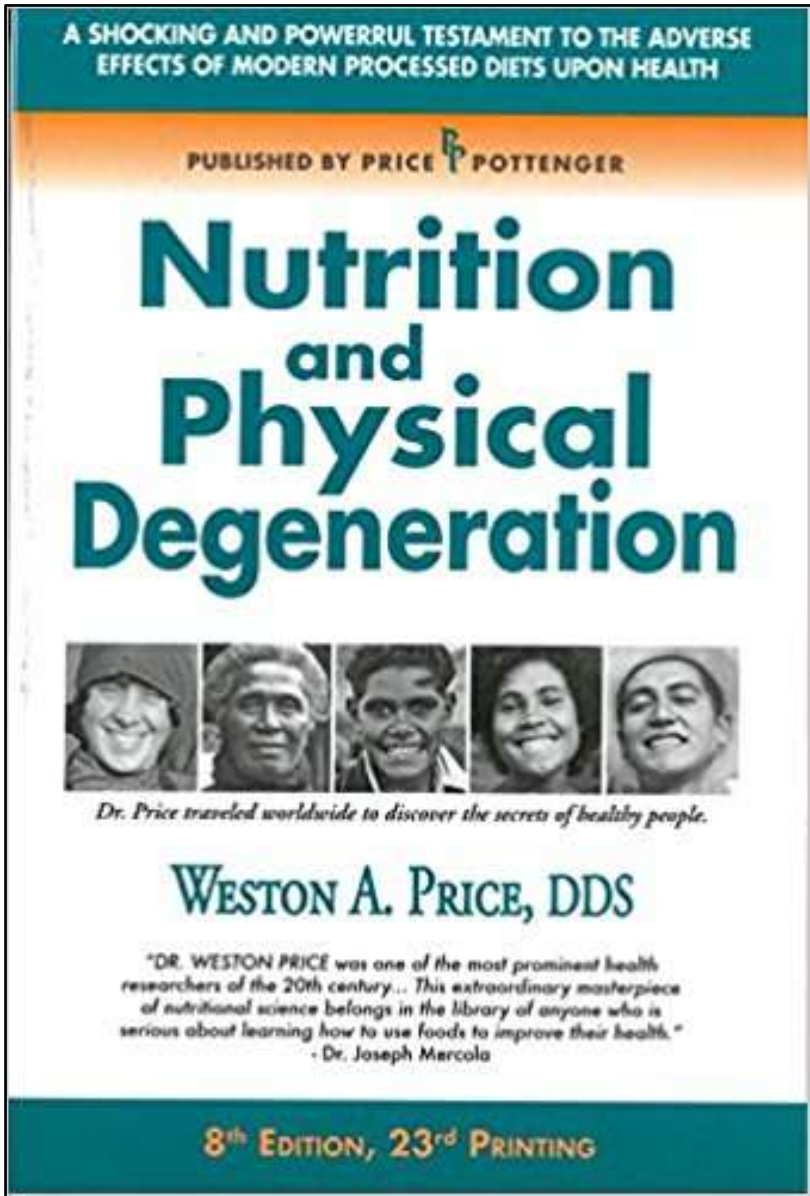
100% of Top Twenty Fast Food Brands Positive for Glyphosate Herbicide 76% Positive for Harmful Pesticides

POSTED BY ZEN HONEYCUTT 4006.40GS ON OCTOBER 11, 2023

Top Twenty Fast Food Brands Glyphosate and Pesticide Testing Report

Moms Across America, a nationwide non-profit, has initiated an extensive testing program on the top twenty fast food brands in America, plus one restaurant, California's In-N-Out Burger. Forty-two samples of 21 brands were tested for the most widely used herbicide in the world, glyphosate, 236 agrochemicals, 4 heavy metals, PFAS, phthalates, and mineral content. The top ten brands were additionally tested for 104 commonly used veterinary drugs and hormones, B Vitamins and calories.

1930s--Dr Weston A. Price



Dr. Price's Findings

- All ate NUTRIENT DENSE foods
  - Vitamins, Minerals, Enzymes, Amino Acids
- Modernized/processed foods brought dental decay and disease
- ABSENCE of nutrients can cause disease!

You Are What You Eat—Pigs (Or Don't Eat)

- 1935 Professor Fred Hale—TX Ag
  - –Vitamin A Deficient

Homestead Example

- “Curled Toe Disease”—Vitamin B

Human Examples

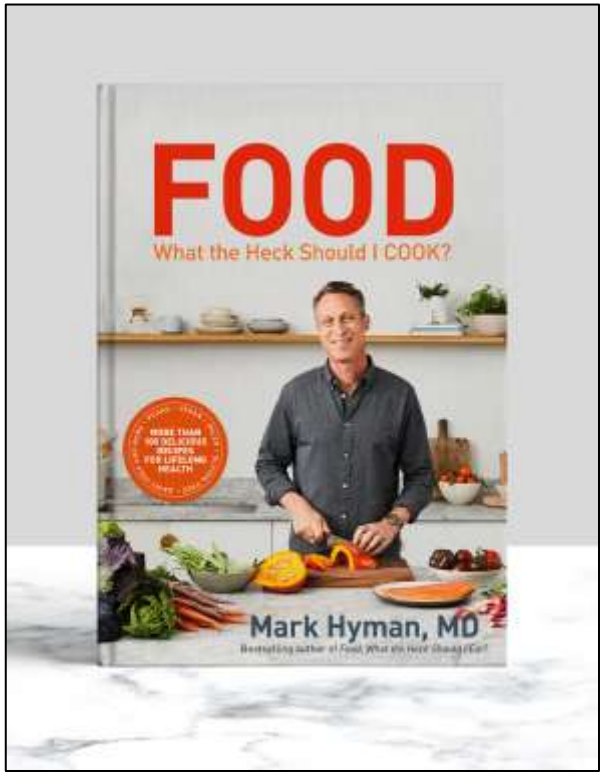
- Scurvy
  - Vitamin C deficiency
- Rickets
  - Vitamin D deficiency
- Goiter
  - Iodine deficiency
- OTHER ????
  - XXXXXX ???

WWII Study: Dutch & Nazi Blockade

- Human Mother is Nutrient Deficient
  - 1st, 2d, 3d trimester

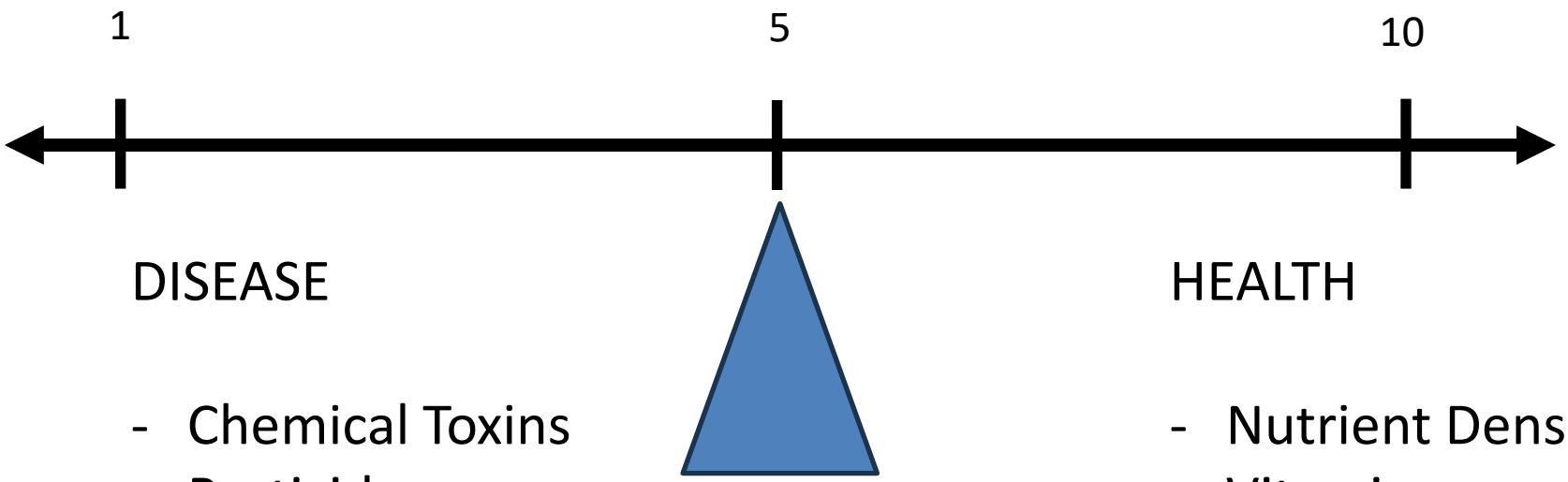
- Babies as Adults: Epigenetics
  - 1st: Cardiovascular; High Cholesterol, Obesity
  - 2d: Glucose Intolerant; Kidney Disease
  - 3d: Asthma

2024--Dr Mark Hyman



“80%+ of all chronic disease is preventable”—through diet!

Health Range (1-10)



DISEASE

- Chemical Toxins
- Pesticides
- GMOs
- Electromagnetic Radiation
- Excessive Stress
- Nutrient Deficiencies

HEALTH

- Nutrient Density
- Vitamins
- Minerals
- Enzymes
- Amino Acids
- Microbiome

What's "NUTRIENT DENSE" Here?


OVER 35% MORE
Enfamil
NEURO PRO
GENTLEASE ALL IN ONE
Infant formula
Milk-based Powder with Iron
BRAIN BUILDING DHA
designed to help REDUCE CRYING IN 24 HOURS
2'-FL HMO for IMMUNE SUPPORT
0-12
NET WT 27.4 OZ


OVER 48% MORE!
NO PALM OLEIN OIL
NO ARTIFICIAL GROWTH HORMONES
Abbott
Similac
PRO-SENSITIVE
For Fussiness & Gas Due to Lactose Sensitivity
IMMUNE SUPPORT
LUTEIN
VITAMIN E
2'-FL HMO
Human Milk Oligosaccharide
DHA
BRAIN & EYE DEVELOPMENT
with Iron
POWDER
NET WT 29.6 OZ


VALUE PACK | 1.6 X MORE!
Nutramigen
with Enflora LGG
HYPOALLERGENIC
Infant Formula Powder with Iron
DHA BRAIN BUILDING NUTRITION
FOR FOOD ALLERGIES INCLUDING COW'S MILK ALLERGY
FAST RELIEF FROM SEVERE CRYING COLIC
NO ARTIFICIAL GROWTH HORMONES
NET WT 19.8 OZ


42.99
comforts
SOY
INFANT FORMULA
WITH IRON
SOY-BASED POWDER
• Complete Soy Nutrition
• For Fussiness & Gas
• Lactose-Free
• DHA, Lutein & Vitamin E
GROWTH
NET WT 22 OZ
(1 LB 6 OZ) 624g

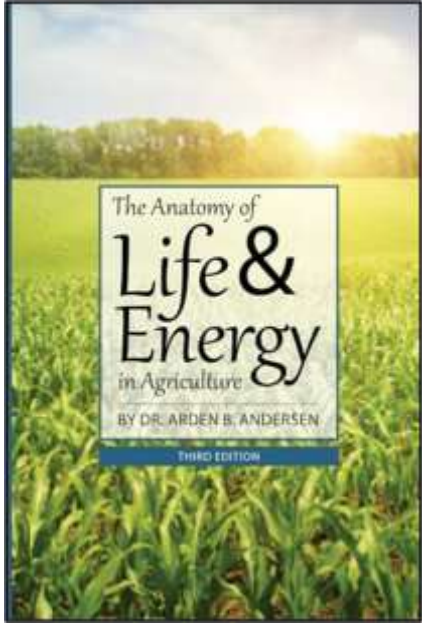

NUTRIENTS per 100 Calories
PROTEIN
FAT
CARBOHYDRATE
WATER
LINOLEIC ACID
VITAMINS
MINERALS
CALCIUM
PHOSPHORUS
MAGNESIUM
IRON
ZINC
MANGANESE
SODIUM
POTASSIUM
CHLORIDE
INGREDIENTS: CORN SYRUP SOLIDS, PARTIALLY HYDROGENATED NONFAT MILK AND WHEY PROTEIN CONCENTRATE SOLIDS, SOY, VEGETABLE OIL (PALM OLEIN, COCONUT, SOY AND HIGH OLEIC SUNFLOWER OILS), AND LESS THAN 2% OF: FRUCTOOLIGOSACCHARIDES, MORTIERELLA ALPINA OIL*, SCHIZOCHYTRIUM SP. OIL*, CALCIUM CARBONATE, SODIUM CITRATE, CALCIUM PHOSPHATE, POTASSIUM CHLORIDE, MAGNESIUM PHOSPHATE, FERROUS SULFATE, ZINC SULFATE, CUPRIC SULFATE, MANGANESE SULFATE, POTASSIUM IODIDE, SODIUM SELENITE, CHOLINE CHLORIDE, INOSITOL, ASCORBIC ACID, NICOTINAMIDE, CALCIUM PANTOTHENATE, RIBOFLAVIN, THIAMIN HYDROCHLORIDE, VITAMIN A PALMITATE, VITAMIN D3, VITAMIN B6 HYDROCHLORIDE, FOLIC ACID, VITAMIN K1, BIOTIN, VITAMIN B12, ACETATE, VITAMIN E ACETATE, SOY LECITHIN, TAURINE, L-CARNITINE.
MEAD JOHNSON & COMPANY, LLC, EVANSVILLE, IN 47721 U.S.A.
Mead Johnson Nutrition
Enfamil Next Step


COMPARED TO OUR
No significant difference has been shown between milk derived from rbST-treated and non-rbST-treated cows
Ingredients not genetically engineered
NOT FOR INFANTS OR CHILDREN WITH GALACTOSEMIA
NUTRIENTS per 100 Calories (5 fl oz, prepared as directed)
PROTEIN
FAT
CARBOHYDRATE
WATER
LINOLEIC ACID
VITAMINS
MINERALS
CALCIUM
ZINC
IRON
MANGANESE
COPPER
SODIUM
POTASSIUM
CHLORIDE


INGREDIENTS: CORN SYRUP SOLIDS (47%), VEGETABLE OIL (PALM OLEIN, COCONUT, SOY, AND HIGH OLEIC SUNFLOWER OILS), CASEIN HYDROLYSATE (MILK) (17%)*, MODIFIED CORN STARCH, AND LESS THAN 2%: MORTIERELLA ALPINA OIL*, SCHIZOCHYTRIUM OIL*, LACTOBACILLUS RHAMNOSUS**, CALCIUM CITRATE, CALCIUM PHOSPHATE, POTASSIUM CHLORIDE, POTASSIUM CITRATE, SODIUM CITRATE, CALCIUM HYDROXIDE, MAGNESIUM OXIDE, FERROUS SULFATE, ZINC SULFATE, CUPRIC SULFATE, MANGANESE SULFATE, SODIUM IODIDE, SODIUM SELENITE, CHOLINE CHLORIDE, ASCORBIC ACID, NICOTINAMIDE, CALCIUM PANTOTHENATE, VITAMIN A PALMITATE, THIAMIN HYDROCHLORIDE, RIBOFLAVIN, VITAMIN B6 HYDROCHLORIDE, FOLIC ACID, VITAMIN K1, BIOTIN, VITAMIN B12, INOSITOL, VITAMIN A PALMITATE, VITAMIN E ACETATE, L-CYSTINE, L-TYROSINE, L-TRYPTOPHAN, TAURINE, L-CARNITINE.
MEAD JOHNSON & COMPANY, LLC
EVANSVILLE, IN 47721 U.S.A.
*MODIFIED TO BE BETTER TOLERATED IN MILK-ALLERGIC BABIES
†A SOURCE OF ARACHIDONIC ACID (ARA)
‡A SOURCE OF DOCOSAHEXAENOIC ACID (DHA)
**BRANDED AS LGG®, A REGISTERED TRADEMARK OF CHR. HANSEN A/S
Filled by weight, not by volume; some settling may occur.
Mead Johnson Nutrition
00871 23945


USE BEFORE DATE ON BOTTOM OF CAN.
INGREDIENTS: CORN SYRUP, SOY PROTEIN ISOLATE, PALM OLEIN, SOY OIL, COCONUT OIL, HIGH OLEIC SAFFLOWER OR SUNFLOWER OIL, LESS THAN 2%: MORTIERELLA ALPINA OIL*, CHYMOSIN*, LUTEIN, FRUCTOOLIGOSACCHARIDES, CALCIUM PHOSPHATE, POTASSIUM CITRATE, POTASSIUM CHLORIDE, MAGNESIUM CHLORIDE, SODIUM CITRATE, ASCORBYL PALMITATE, FERROUS SULFATE, INOSITOL, MIXED TOCOPHEROLS, L-METHIONINE, TAURINE, ASCORBYL PALMITATE, FERROUS SULFATE, INOSITOL, MIXED TOCOPHEROLS, CITRATE, ZINC SULFATE, VITAMIN E (dl-ALPHA TOCOPHERYL ACETATE), L-CARNITINE, NICOTINAMIDE, CALCIUM PANTOTHENATE, CUPRIC SULFATE, THIAMINE HYDROCHLORIDE, VITAMIN A PALMITATE, RIBOFLAVIN, PYRIDOXINE HYDROCHLORIDE, FOLIC ACID, POTASSIUM IODIDE, PHYTONADIONE (VITAMIN K1), BIOTIN, SODIUM SELENITE, BETA-CAROTENE, VITAMIN D3, CYANOCOBALAMIN (VITAMIN B12), MONOGLYCERIDES, SOY LECITHIN, TRIBASIC CALCIUM PHOSPHATE, CALCIUM CARBONATE, MANGANESE SULFATE, POTASSIUM BICARBONATE.
CONTAINS: SOY.
PER 100 CALORIES
PROTEIN
FAT
CARBOHYDRATE
VITAMIN C (ASCORBIC ACID)
CHOLINE
INOSITOL
MINERALS
CALCIUM
PHOSPHORUS
MAGNESIUM
SODIUM
ZINC
MANGANESE
COPPER
IODINE
SELENIUM
CHLORIDE

Dr Arden Andersen



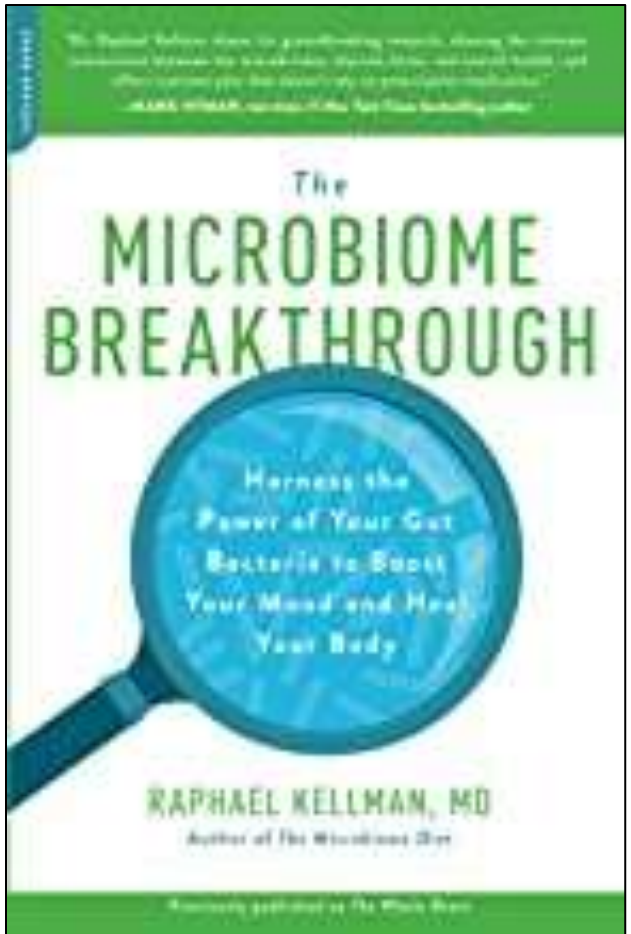
- Up to 38% decline in nutrients (1950-1999)
  - Protein, Ca, Vit C, P, Fe
  - USDA Data; Davis, Epp & Riordan JACN
- Avg 63% decline (1941-2001)
  - Fe, Zn, Cu, Mn, Se
  - Huling, Dec 2001; Thomas, Analysis of UK, 2003

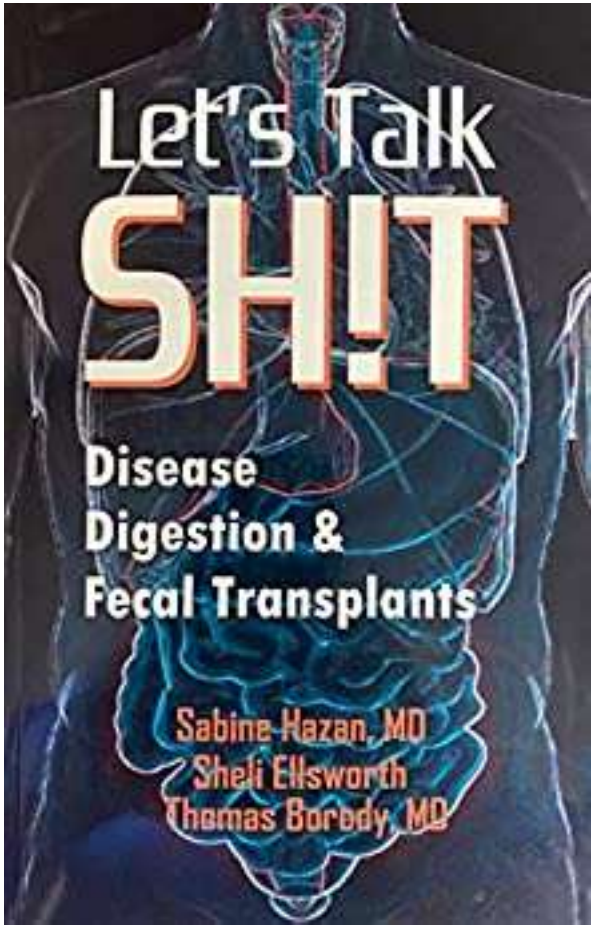
?

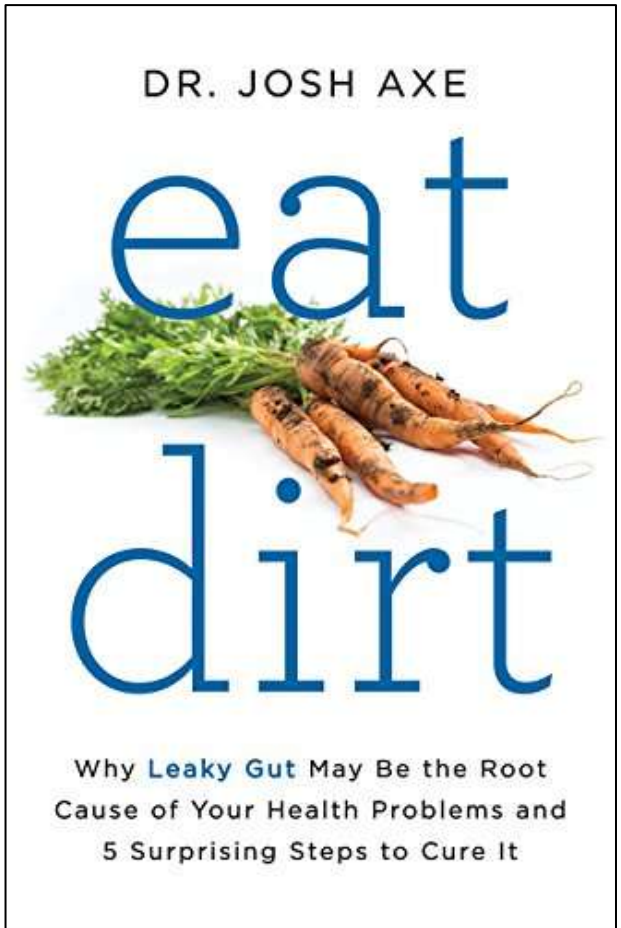
=

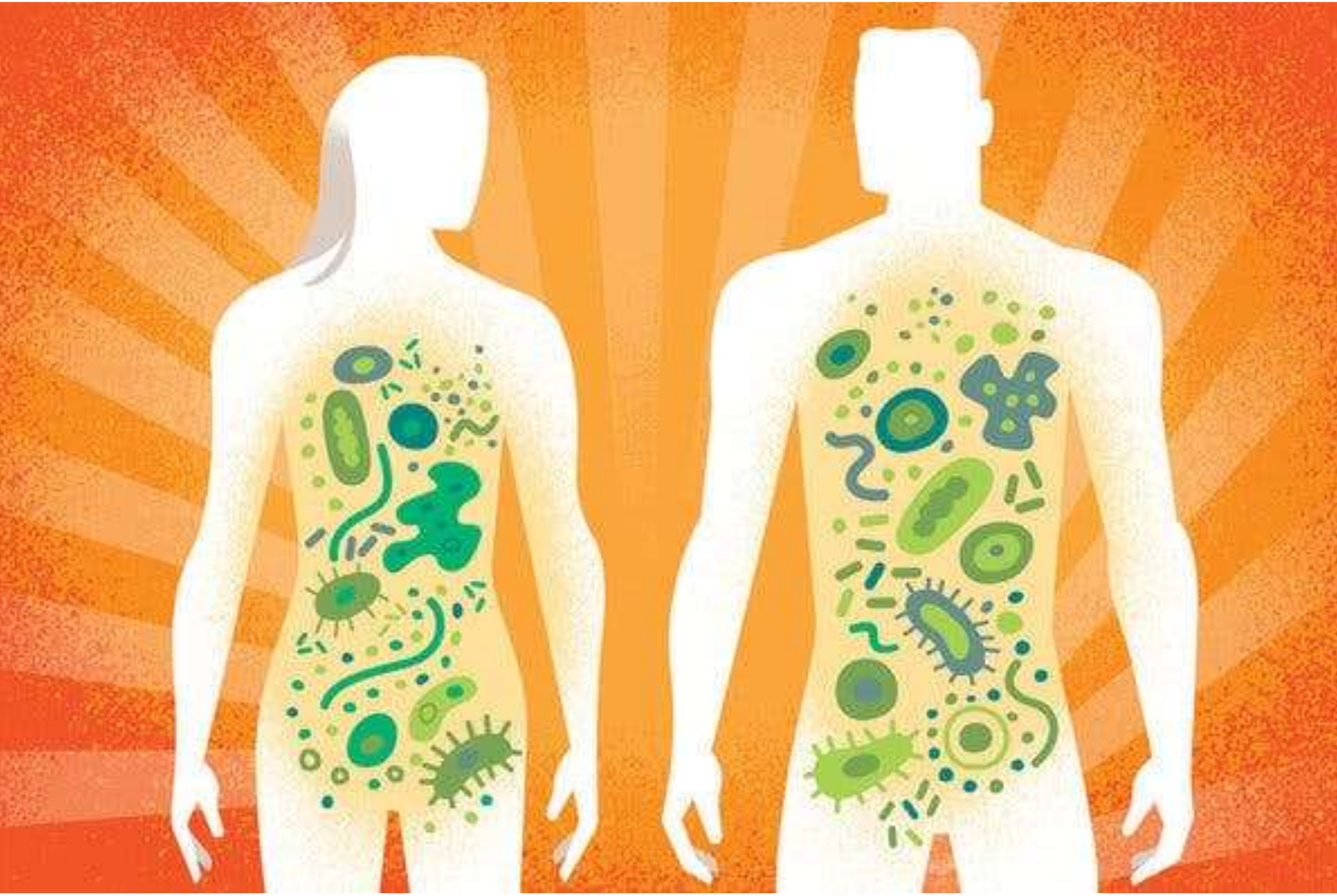
2016 Human Microbiome

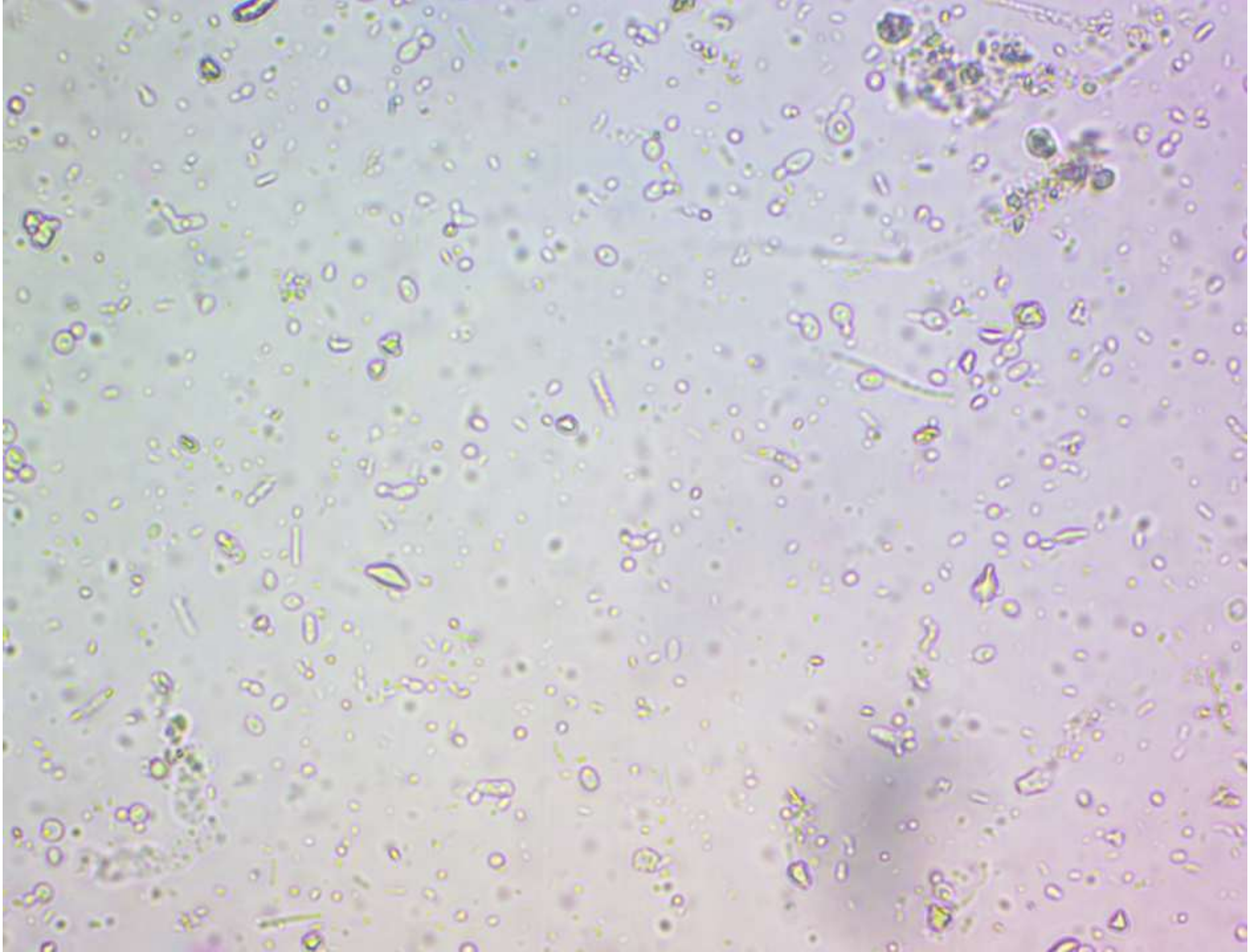
- Very Small Life—can't see with naked eye
- 10X more critters living in/on you than human cells









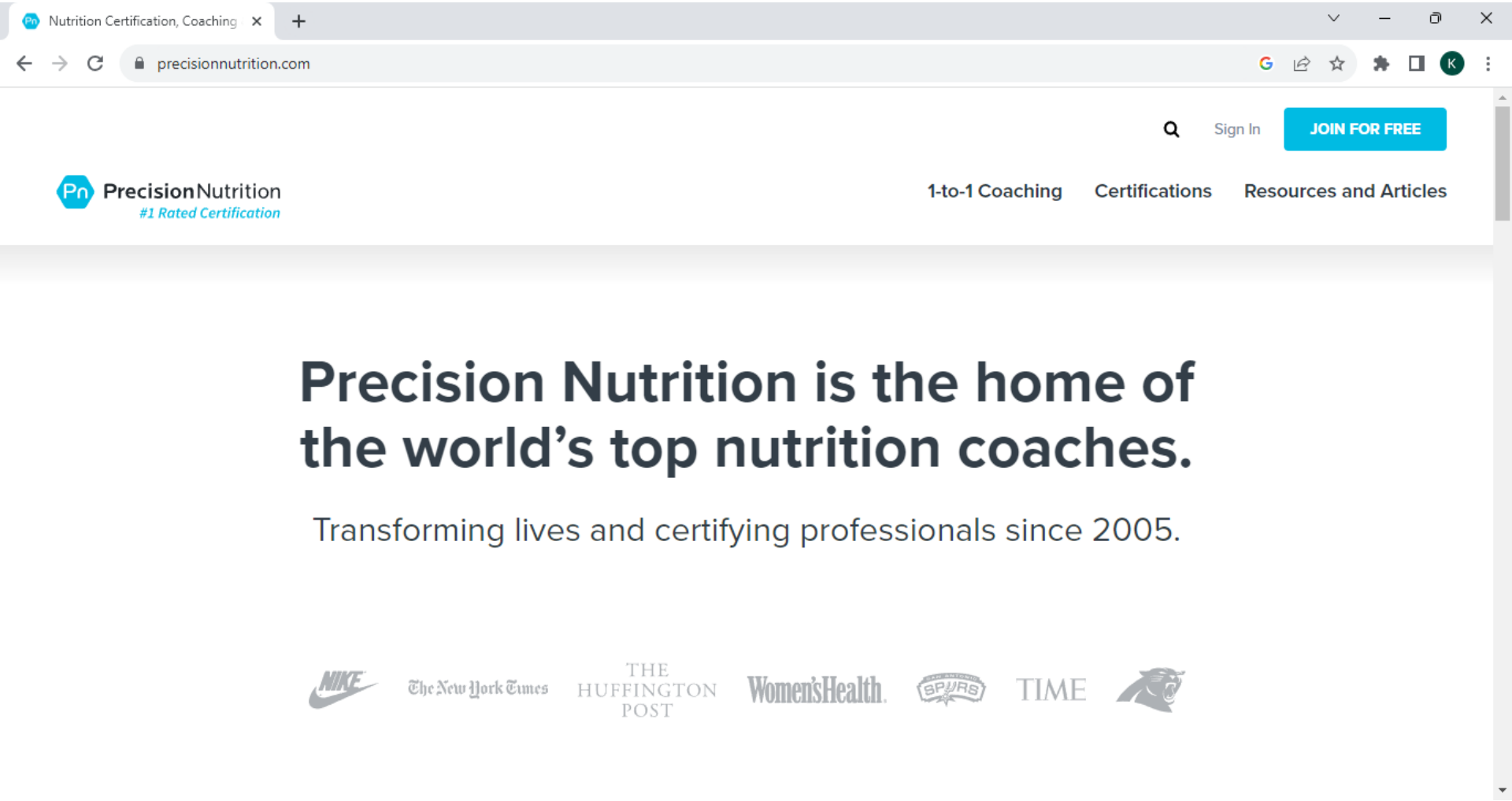


Two Keys to Human Health

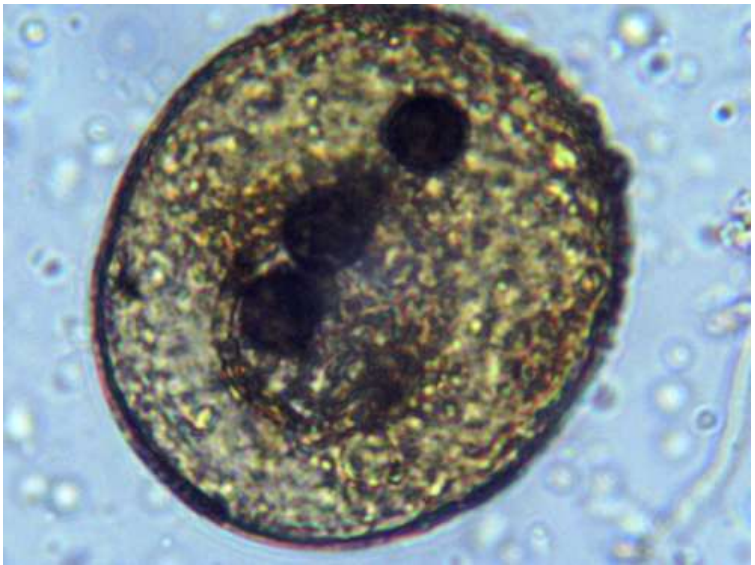
- ✓**Nutrient Dense Food**
- ✓**Healthy Microbiome**

- So…where do they come from?

Health/Nutrition Coach



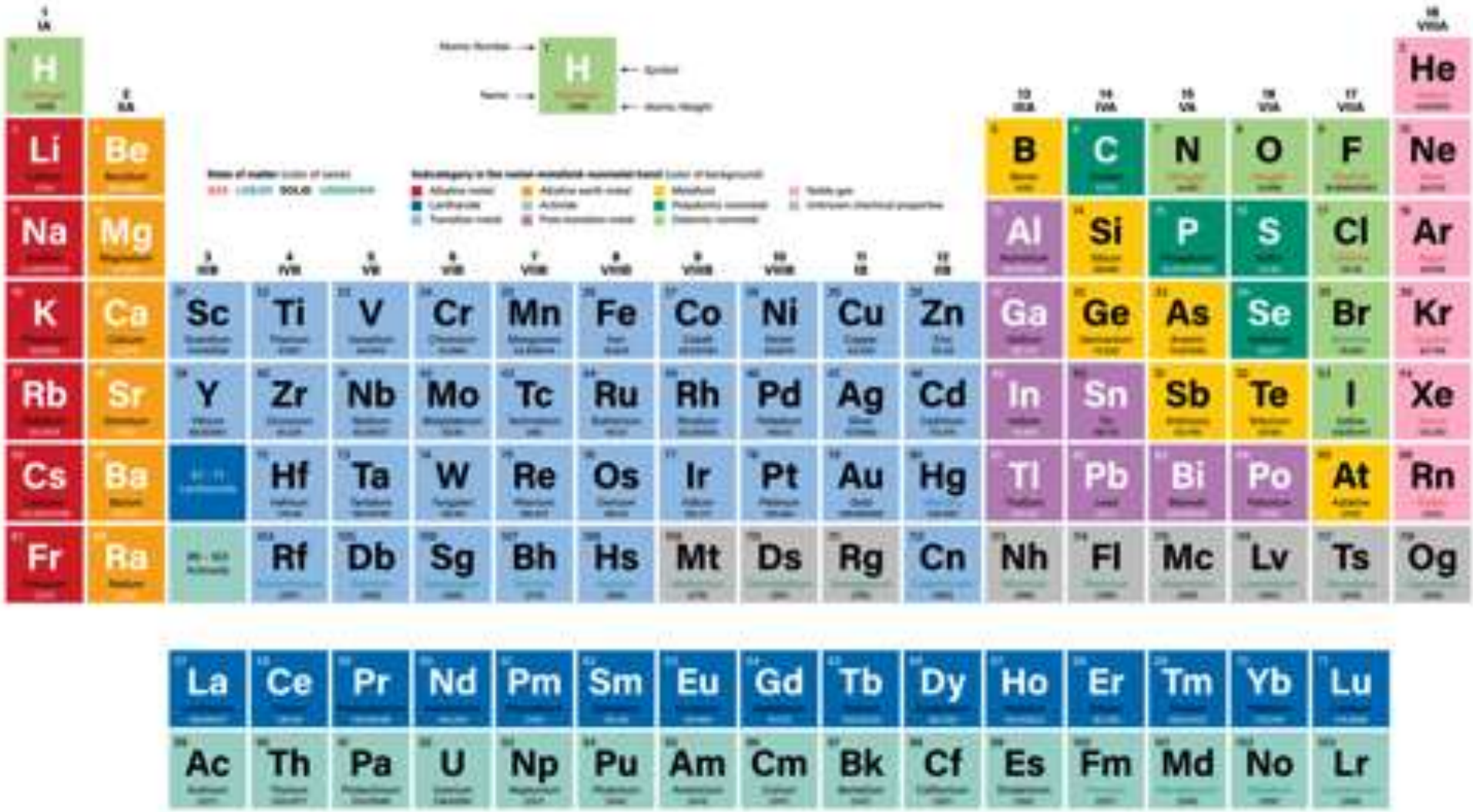
2019 Dr. Elaine Ingham (PhD in 1981)

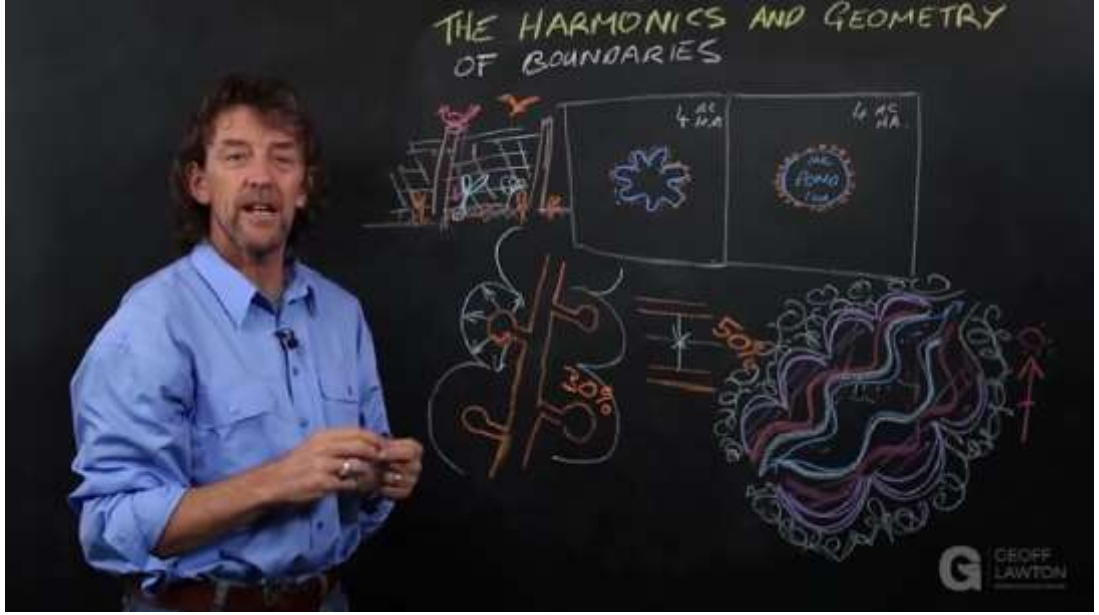


- Soilfoodweb School
  - Fundamental Courses
  - Certified Lab-Tech
  - Consultant Training Program
    - Microbiome
    - Make biological amendments
    - Microscopy
    - Turn dirt to soil

- Korean Natural Farming—Chris Trump
- **Biology is most important ingredient**
  - N, P, K not enough…plants need all nutrients
    - Plant “blood” 1:30 dilution of sea water

Periodic Table of the Elements

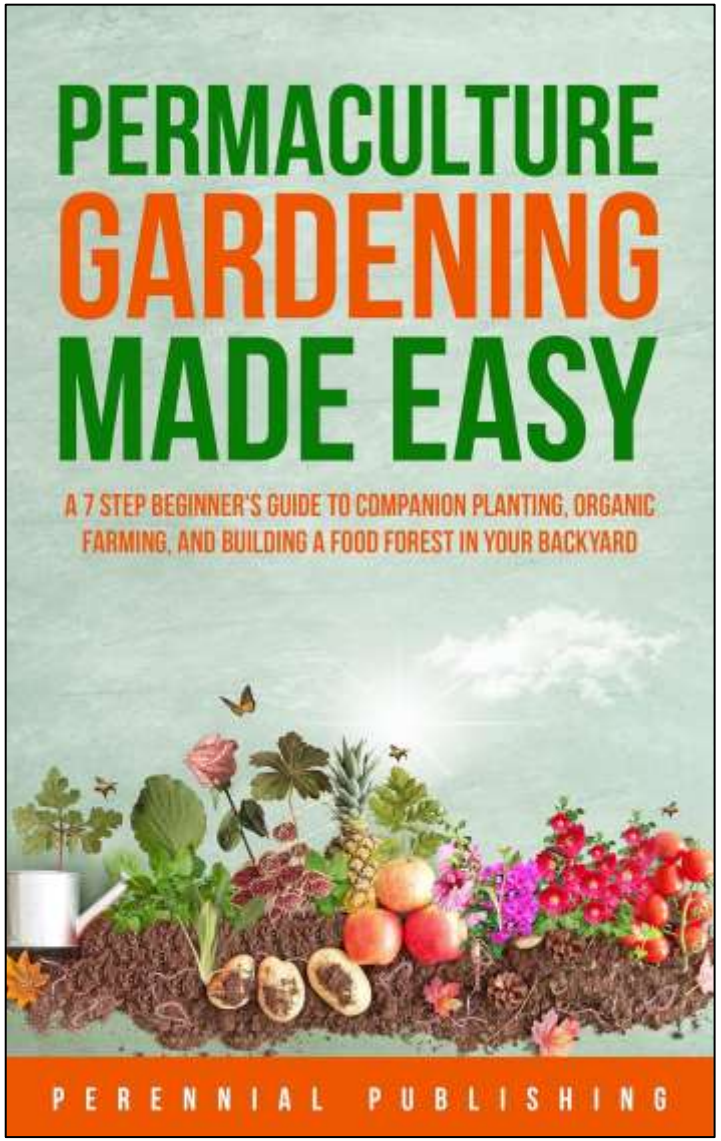


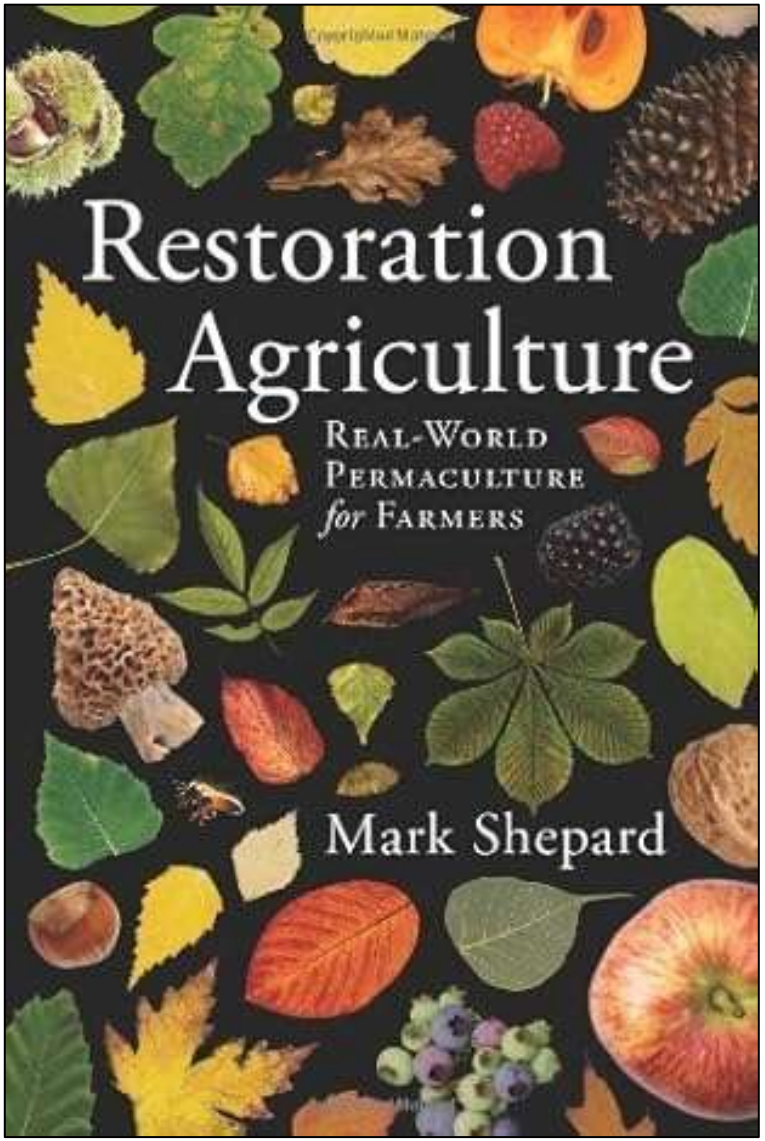


Geoff Lawton's

Permaculture Design Certification

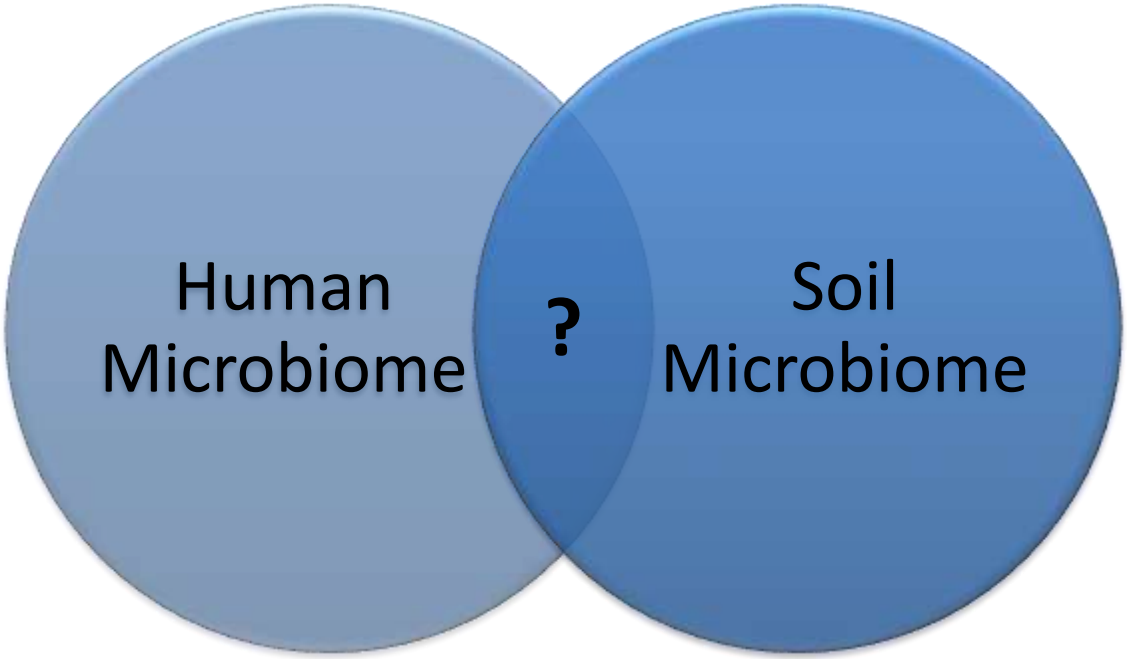
Permaculture for the Homesteader





Where Do They Come From?

- The Soil!!
- Nature's perfect plan where life promotes life



90 Years Ago!!

Cosmopolitan—Jun 1936

- US Senate Document #264 (Jun 36)
- Dr Charles Northen, MD

  “Healthy plants mean healthy people. We can’t raise a strong race on weak soil.”

Dirt vs Soil

- Dirt–physical rocks, sand, silt & clay
- Soil—living skin of the planet
  - Handful of healthy soil has more critters in it than people on planet earth
  - Not just there for the “hell of it”

But, Dirt's Taking Over

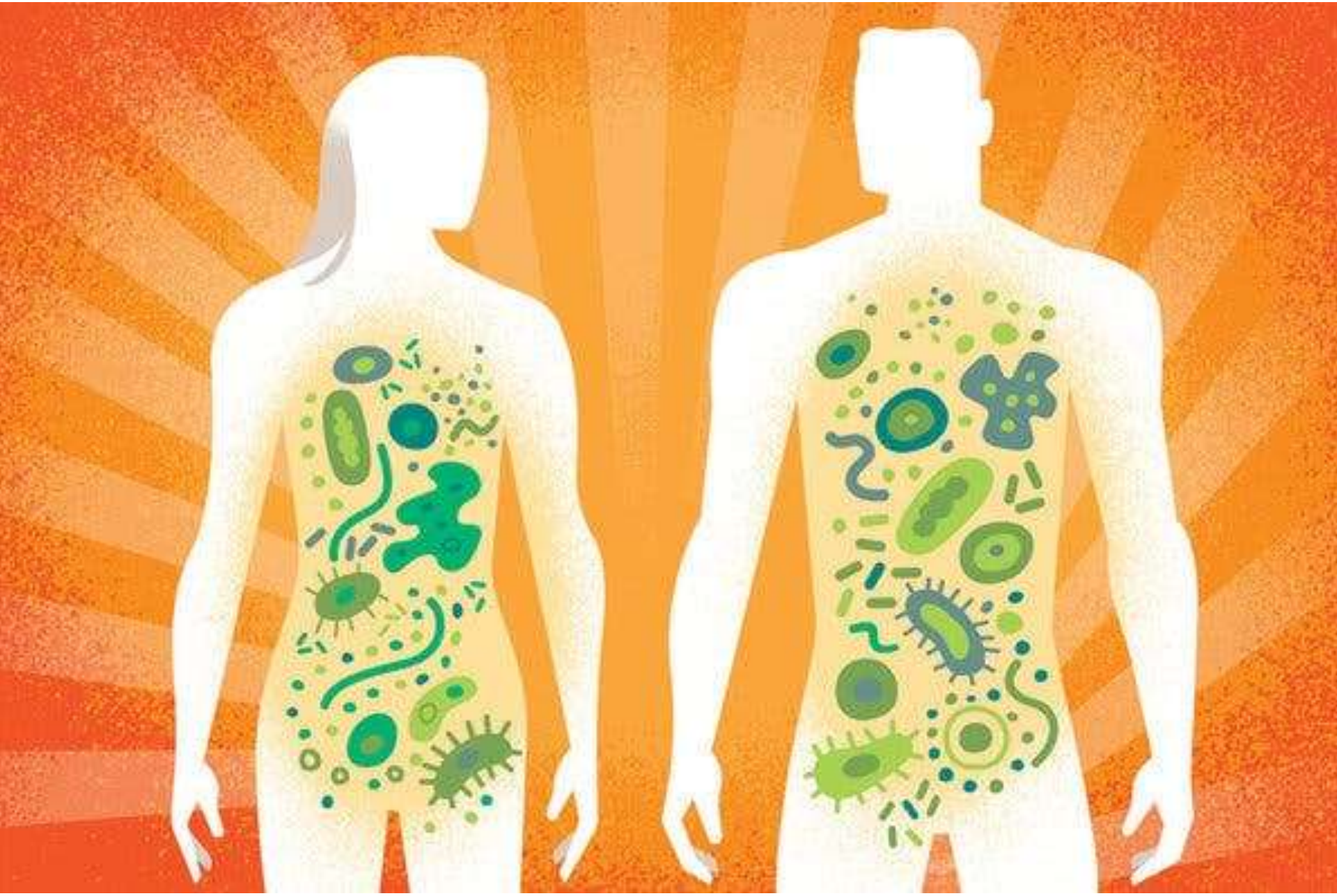
- Modern agriculture focused on "chemistry"
- What kills biology?
  - Excessive Tillage
  - Chemical/Synthetic Fertilizers (N, P, K)
  - "icides"...Herbicides & Insecticides




REFILL
Roundup

Symptoms of “Dirt”

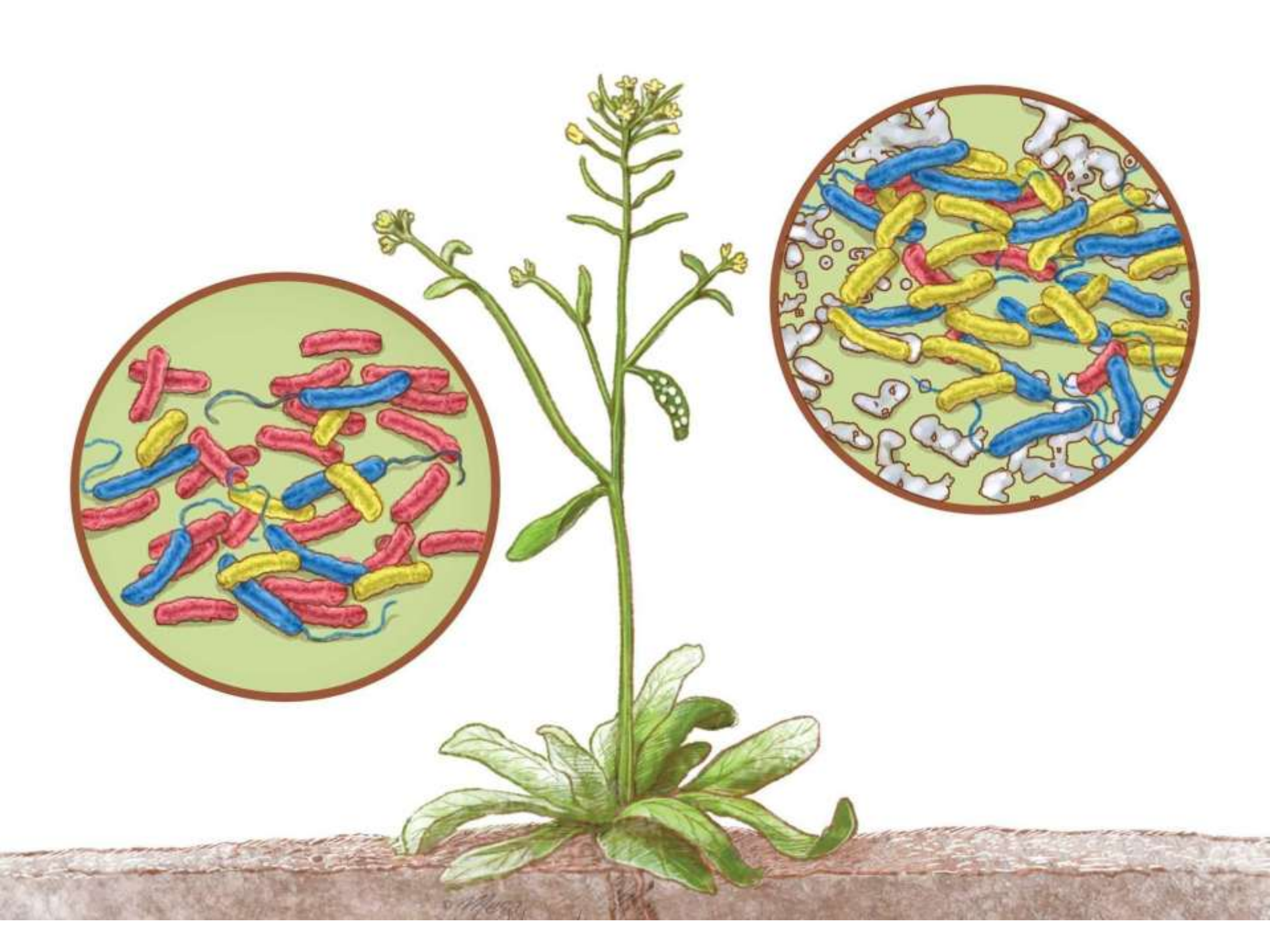
- Sick plants—reduced yield/quality
- Pests (weeds, insects, diseases)
  - Need lots of “inputs” and $$
- Poor water infiltration
- Erosion

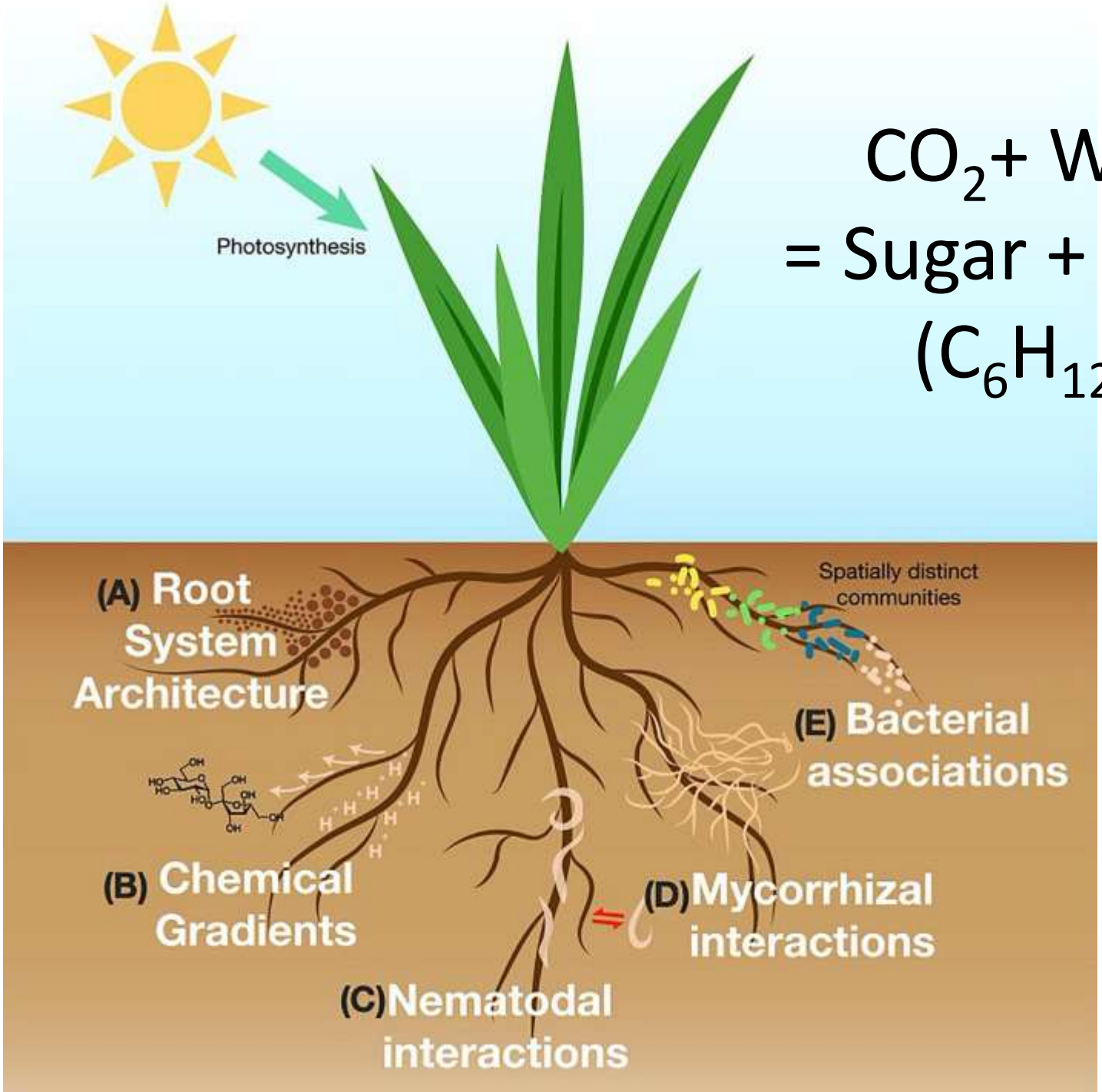


(Patterns of Nature)
Plants have Microbiome Too!!

- Caretakers of the plants
  - Live on and inside
  - Recycle nutrients (dead plants/animals)
  - Harvest minerals from sand, silt, clay
  - Make Vitamins & Enzymes plant can't

- Inject Nutrient Density at bottom of food chain

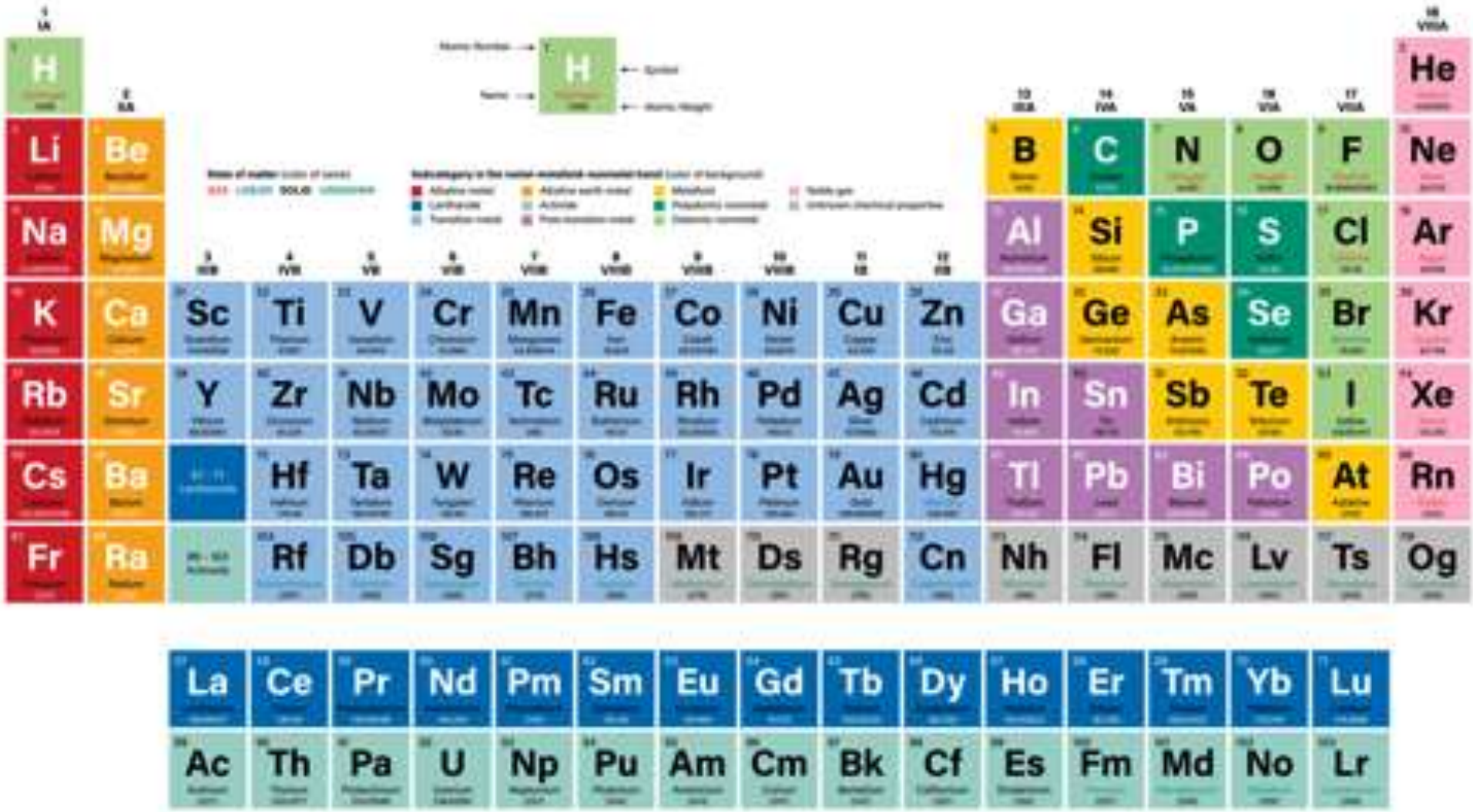




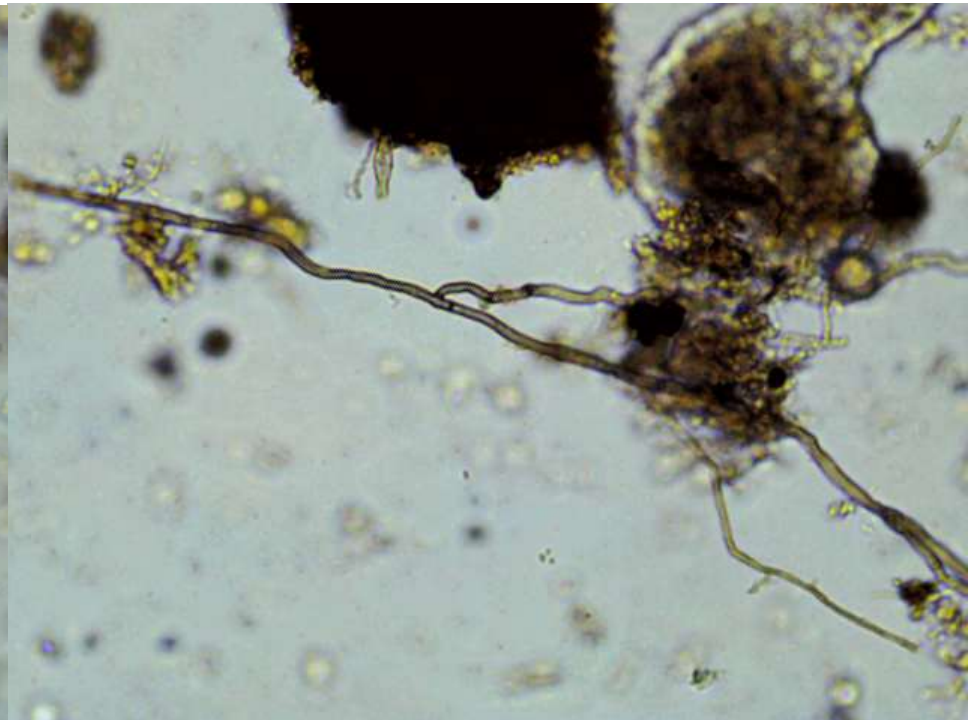
CO_2+ Water
= Sugar + Oxygen
($C_6H_{12}O_6$)

Photo Source: Soil Science Society of America

Periodic Table of the Elements

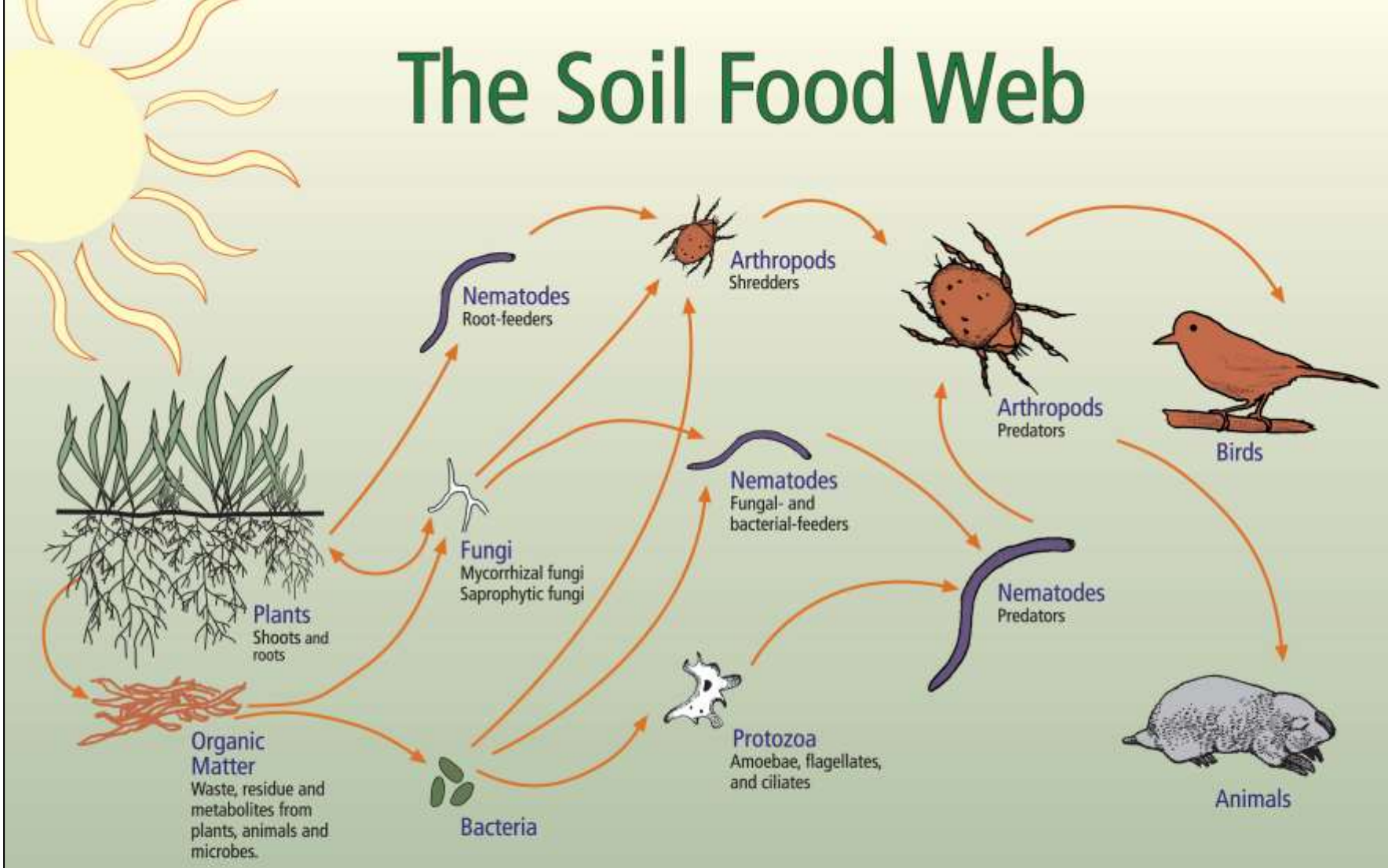





Exposed rocks
Lichens and mosses
Annual weeds
Perennial weeds and grasses
Shrubs
Aspen, cherry, and young pine forest
Beech and maple broadleaf forest
Time

The Soil Food Web



First trophic level:
Photosynthesizers

Second trophic level:
Decomposers
Mutualists
Pathogens, Parasites
Root-feeders

Third trophic level:
Shredders
Predators
Grazers

Fourth trophic level:
Higher level
predators

Fifth and higher trophic levels:
Higher level
predators

Standard Soil Test

Lab Number: 602069 **Sample Name:** TEST2 **Farm Name:**

Soil Results

pH		Phosphorus	Potassium	Calcium	Magnesium	Zinc	Iron	Manganese	Boron	Sodium
Soil pH	Buffer Value	P	K	Ca	Mg	Zn	Fe	Mn	B	Na
		Pounds per acre - Mehlich 1								
6.65		25 M	84 L	1842 S	140 S	2.3 S	17 S	20 S	0.5	12

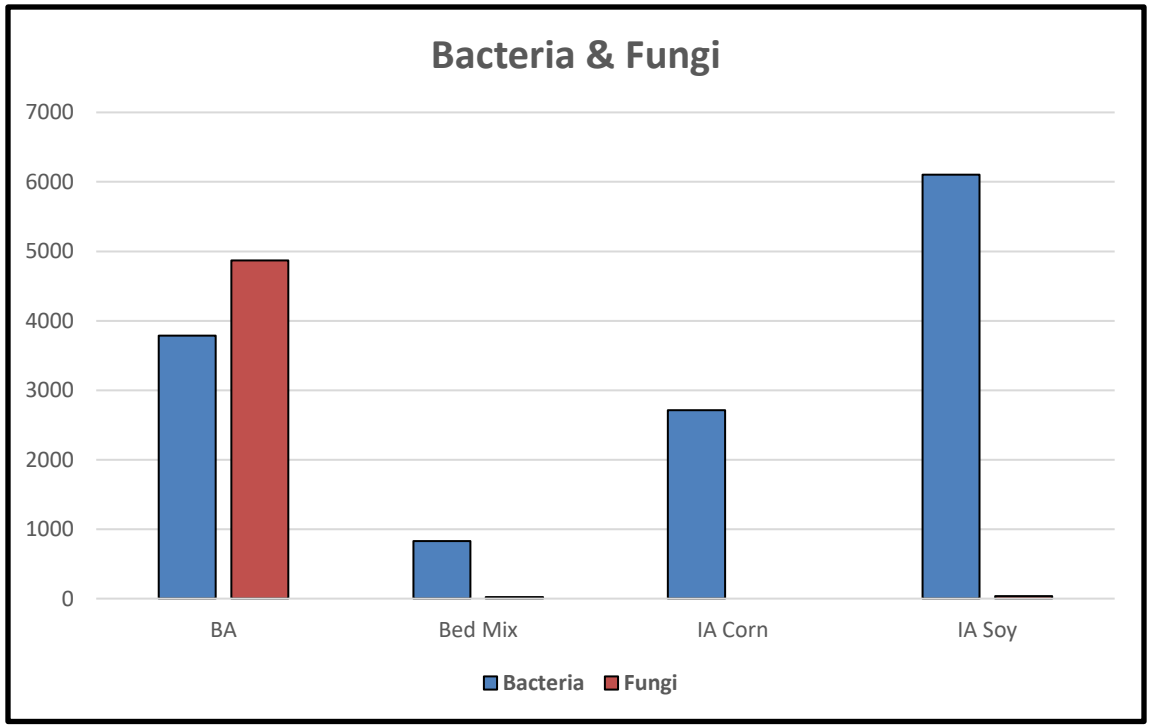
Crop/plant Interpretation ranges on last sheet

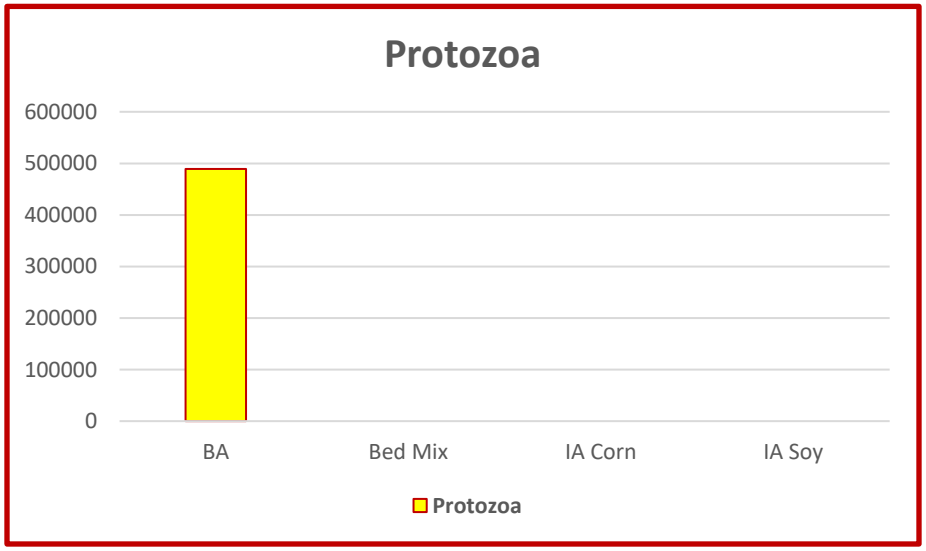
L = Low, M= Medium, H=High, V= Very High, S = Sufficient

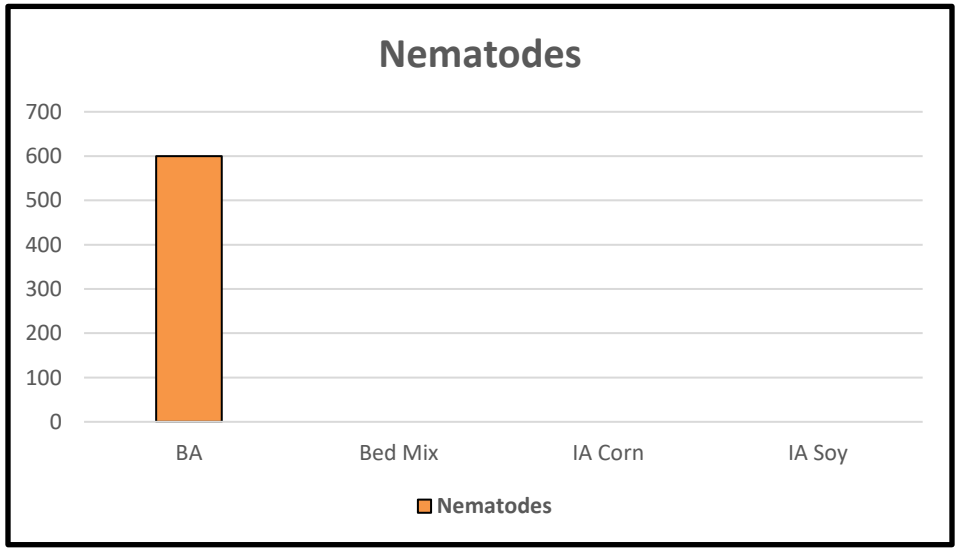
Additional tests, if they were requested											
Sulfur	Nitrogen			Carbon	C/N Ratio	Organic Matter	Soluble Salts	Particle Size Analysis - Hydrometer Method			
LBS/ACRE	NH4-N ppm	NO3-N ppm	Total N %	%	%	%	dS/m	% Sand	% Silt	% Clay	Soil Texture
						3.3	0.03	20	64	16	Silt Loam

AFExtractDrenchResults_2022-04-11

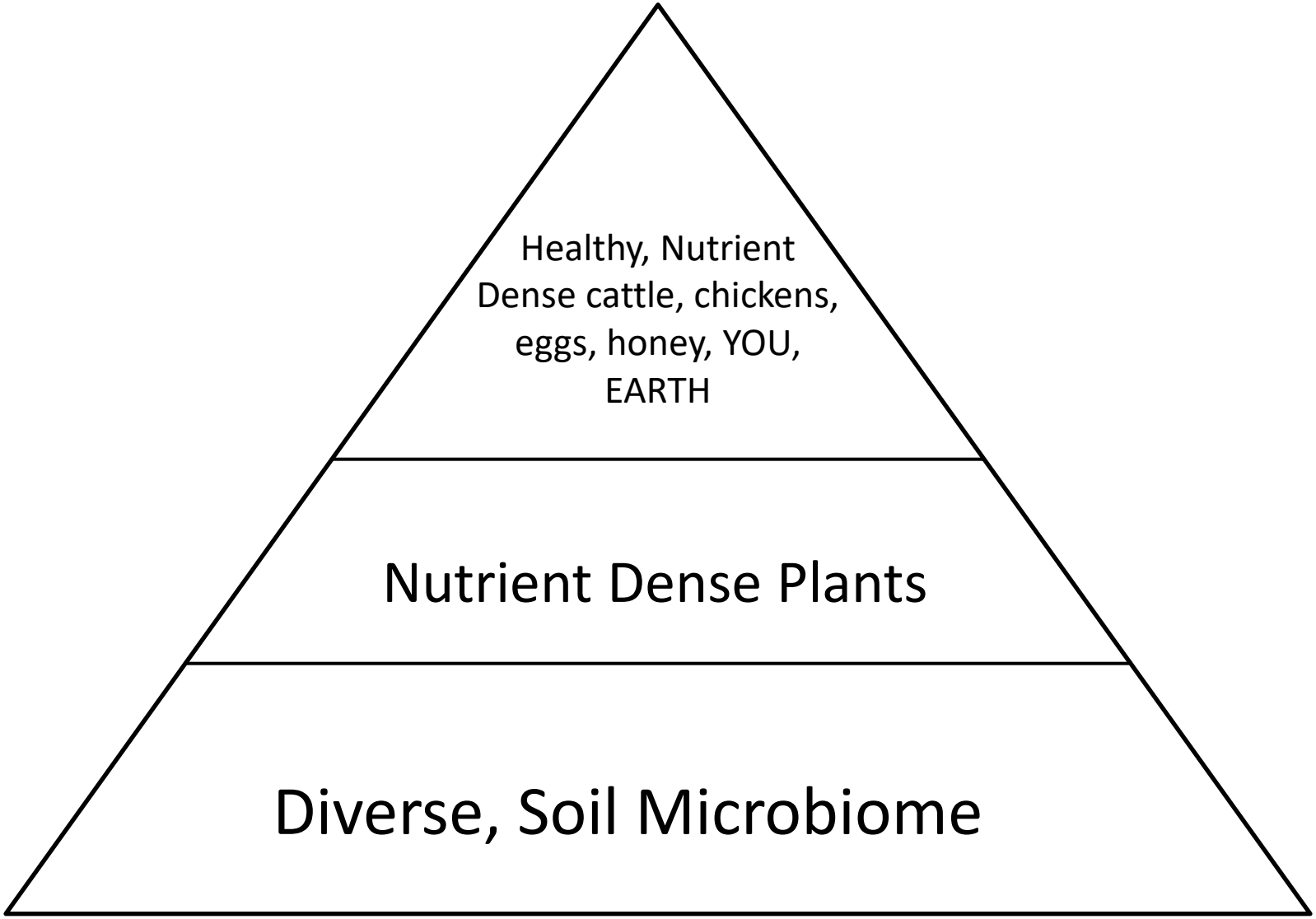
Beneficial Microorganisms	Sample Results
Bacterial Biomass (µg/g)	724.142
Bacterial Standard Deviation Biomass (µg/g)	87.835
Bacterial Standard Deviation as Percentage of Mean	12.10%
Actinobacterial Biomass (µg/g)	0.167
Actinobacterial Standard Deviation Biomass (µg/g)	0.16
Actinobacterial Standard Deviation as Percentage of Mean	95.90%
Fungal Biomass (µg/g)	851.77
Fungal Standard Deviation Biomass (µg/g)	882.451
Fungal Standard Deviation as Percentage of Mean	103.60%
Fungal Average Diameter - Weighted Mean (um)	6.881
F:B Ratio	1.176
Total Beneficial Protozoa (number/g)	136953
Flagellates (number/g)	61629
Flagellates Standard Deviation (number/g)	19519
Flagellates Standard Deviation as Percentage of Mean	31.70%
Amoebae (number/g)	75324
Amoebae Standard Deviation (number/g)	22968
Amoebae Standard Deviation as Percentage of Mean	30.50%
Bacterial-feeding Nematodes (number/g)	21
Fungal-feeding Nematodes (number/g)	0
Predatory Nematodes (number/g)	0
Detrimental Microorganisms	
Oomycetes Biomass (µg/g)	0
Oomycetes Standard Deviation Biomass (µg/g)	0
Oomycete Standard Deviation as Percentage of Mean	0.00%
Oomycetes Average Diameter - Weighted Mean (um)	0
Ciliates (number/g)	3424
Ciliates Standard Deviation (number/g)	4688
Ciliates Standard Deviation as Percentage of Mean	136.90%
Root-feeding Nematodes (number/g)	0
Total Beneficial Protozoa Standard Deviation (number/g)	35807
Total Beneficial Protozoa Standard Deviation as Percentage of Mean	26.10%


Bacteria & Fungi
7000
6000
5000
4000
3000
2000
1000
0
BA
Bed Mix
IA Corn
IA Soy
Bacteria
Fungi


Protozoa
600000
500000
400000
300000
200000
100000
0
BA
Bed Mix
IA Corn
IA Soy
Protozoa


Nematodes
700
600
500
400
300
200
100
0
BA
Bed Mix
IA Corn
IA Soy
Nematodes

The Foundation--Microbiome



Congratulations!

- ✓ First Step—You Know Why!!!!
  - Most important Step!!

BREAK TIME!

Part 2—“Living Soil” Deeper Dive

Objectives—Part 2

- Truth
- Nutrient Density & Brix
- Biology, Chemistry & Physics

Grounded in a Quote

- “When you start to question where your food comes from, you begin to question everything.”

Joel Salatin

#1 Lesson: Be Skeptical

- *How Do You Know That to Be True?*

- "Without data, you're just another person with an opinion" (W. Edward Deming)

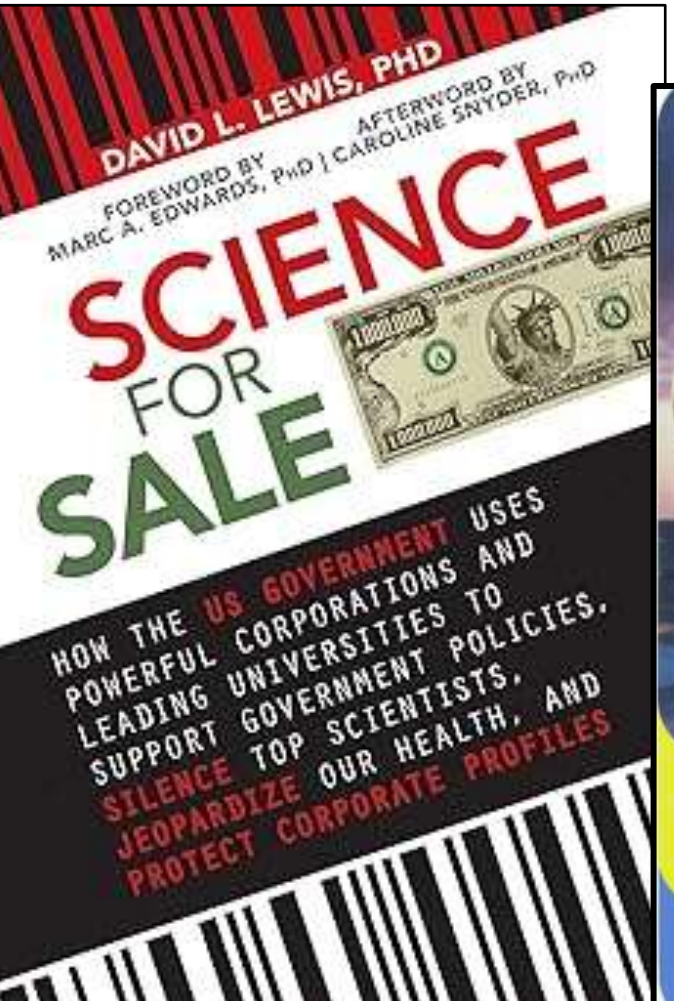
- But, be open minded!!!

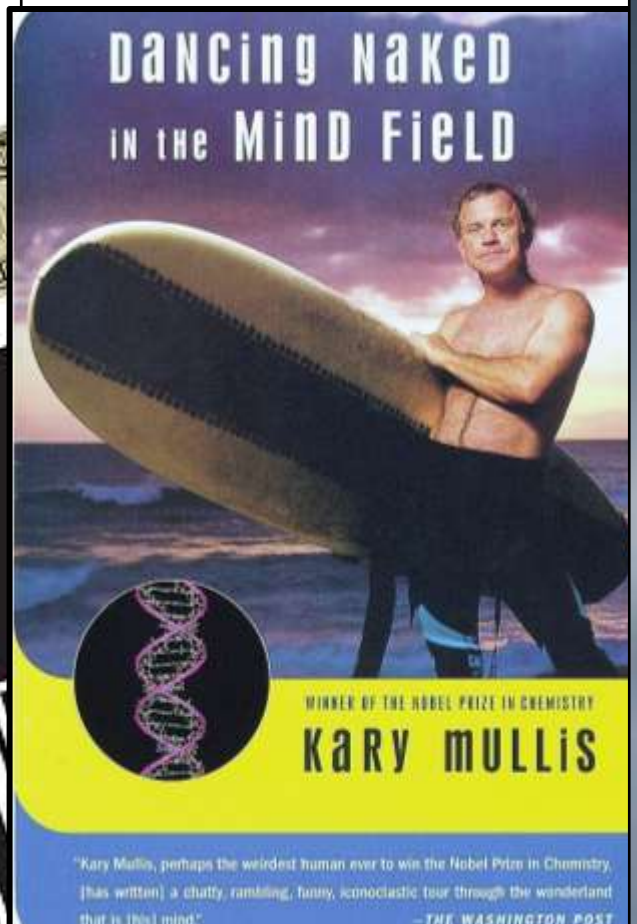
Follow the Science!

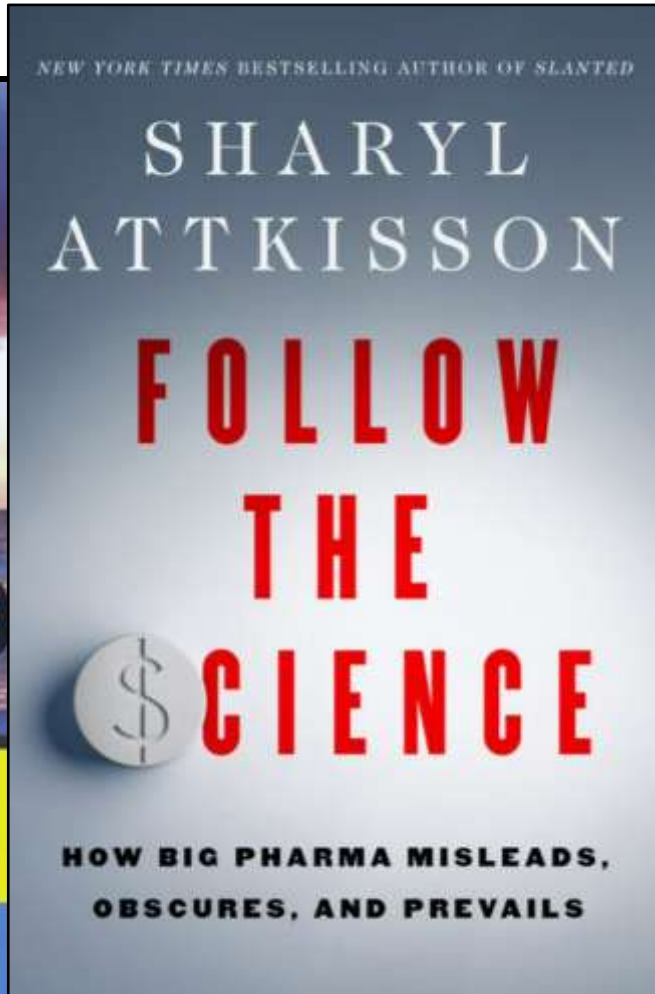
- Easy for “Physical” Science

Follow the Science—Ha!!

- "Probably the most important scientific development of the 20th century is that economics replaced curiosity as the driving force behind research"

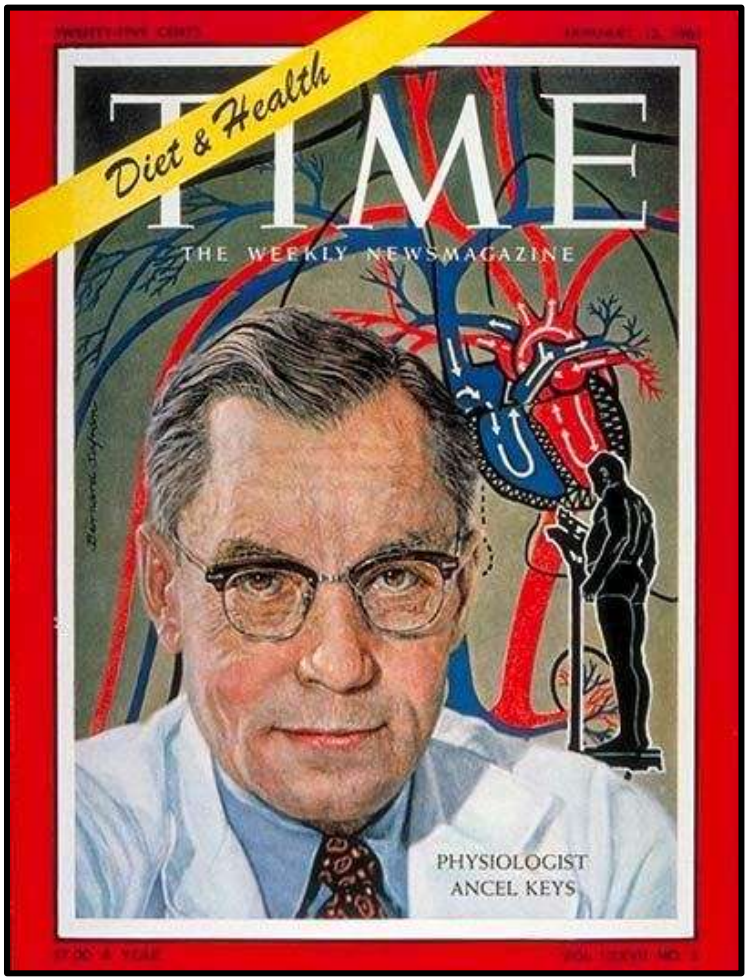




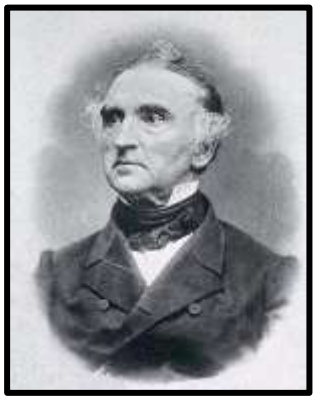


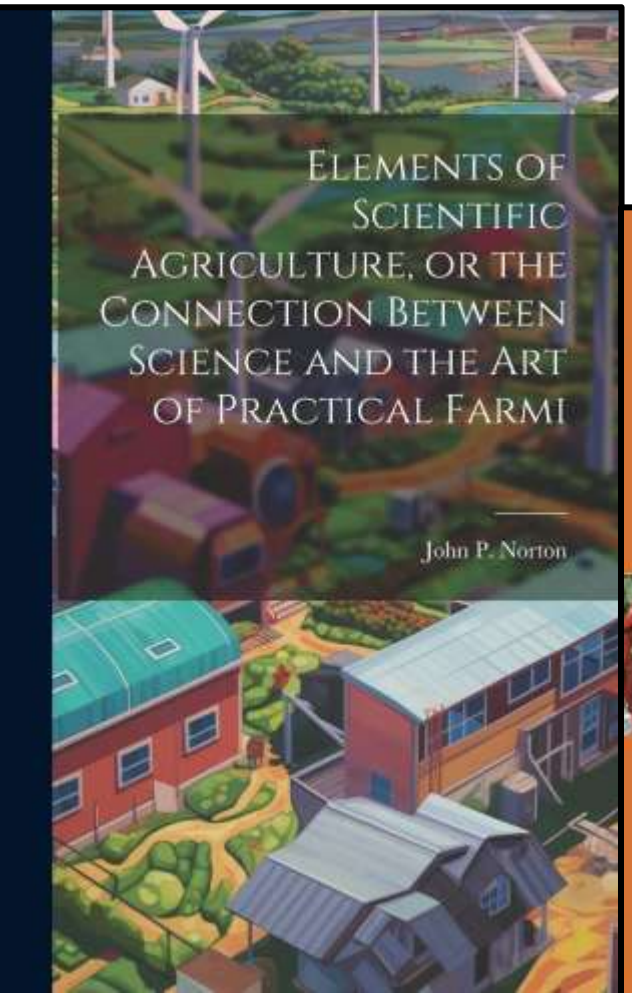
Hmmm—”No Fat/Low Fat”

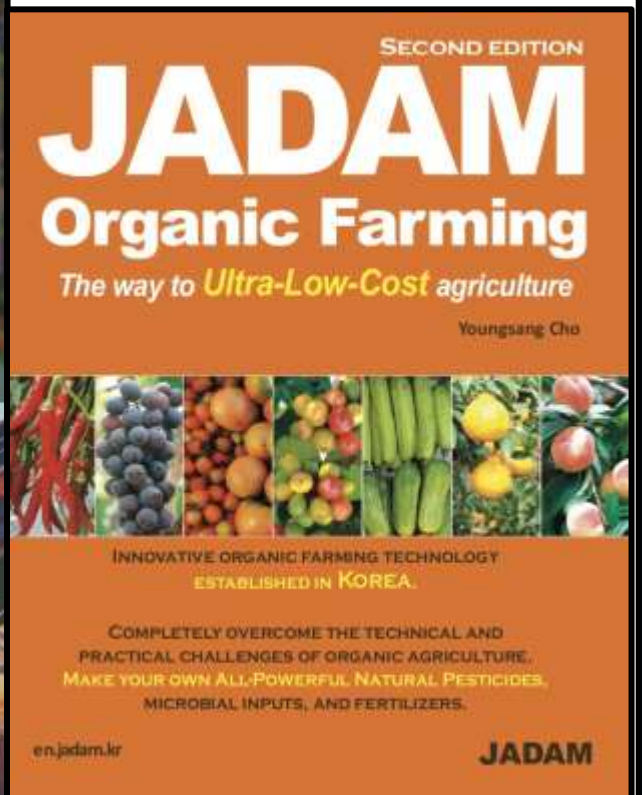
- OMG—FAT & CHOLESTEROL!!
- No butter—Margarine!
- No egg yolks—Eggbeaters!
- No whole milk—Skim!
- No animal fats—Veg Oils
- Low Fat Carbs!!

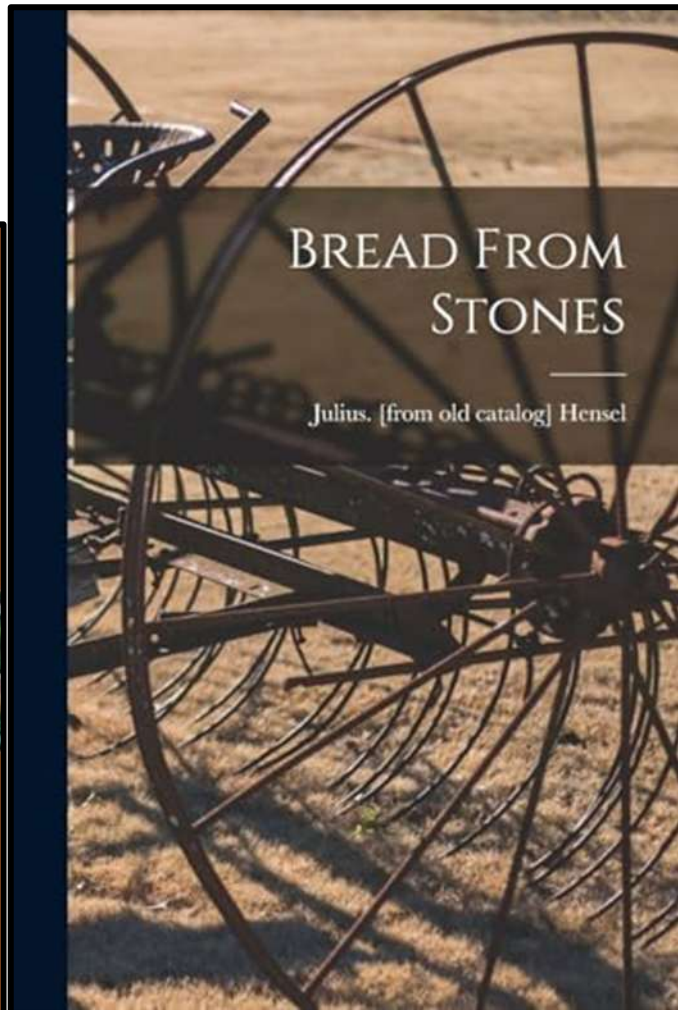


Hmmm—”N-P-K Fertilizer”



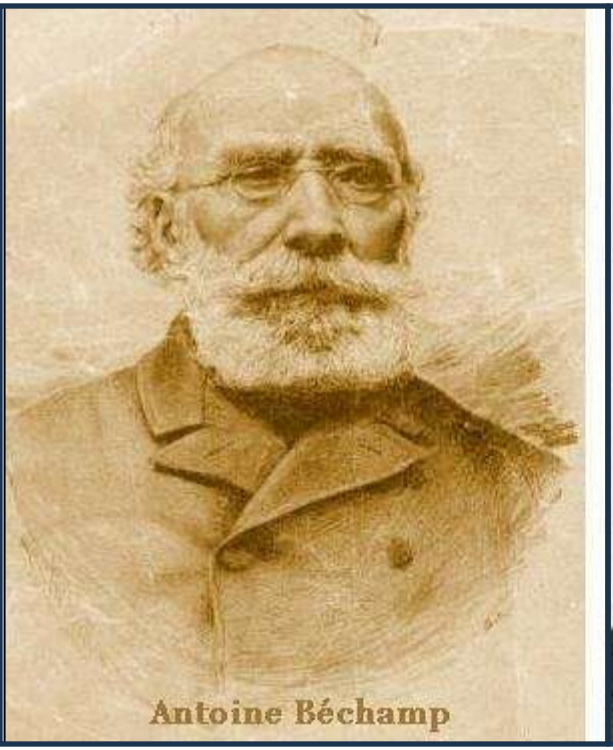


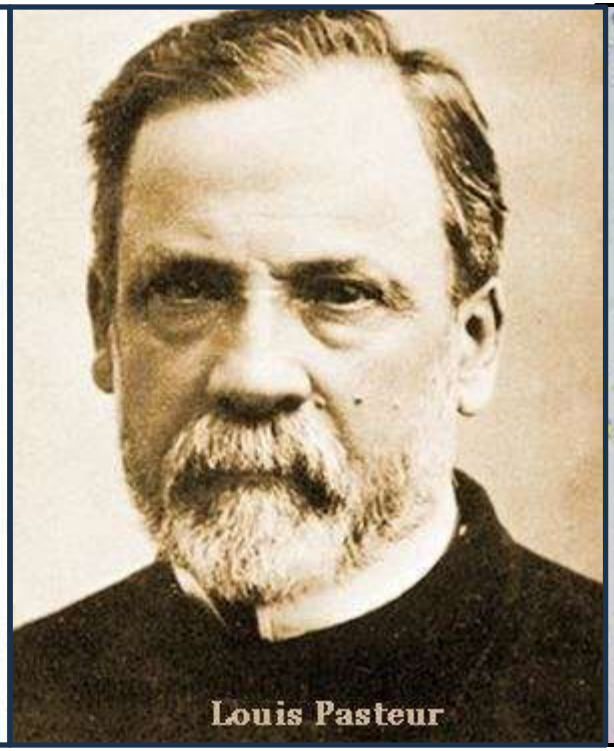


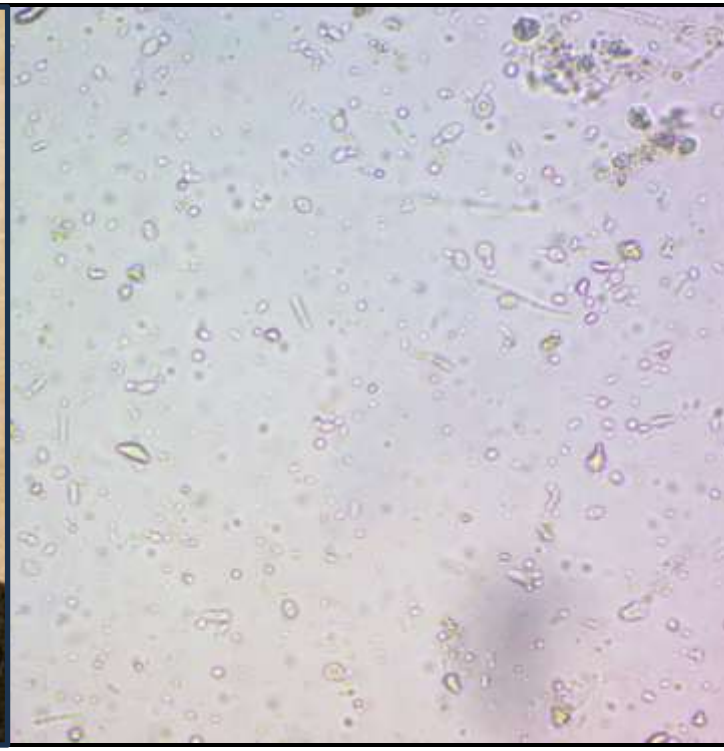


Hmmm—"Germs"

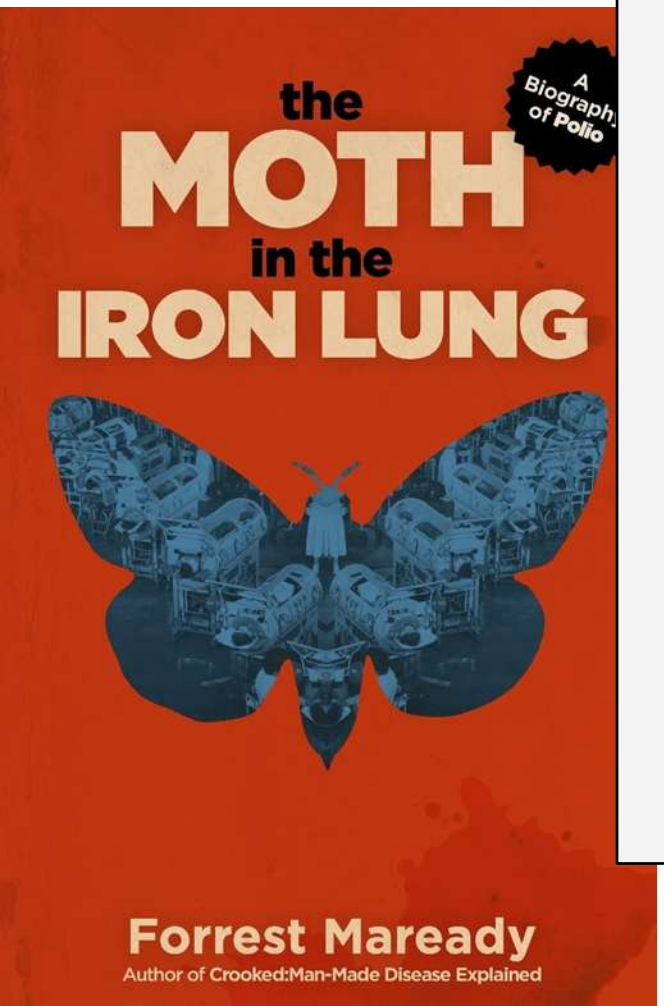
- Dr Louis Pasteur—"Germ Theory"

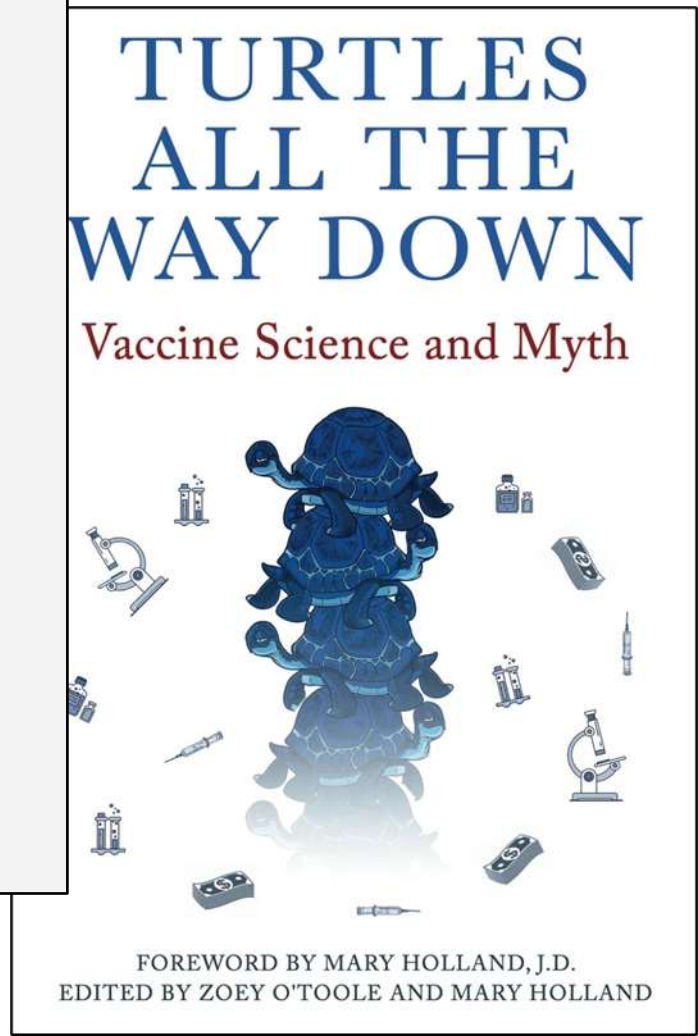




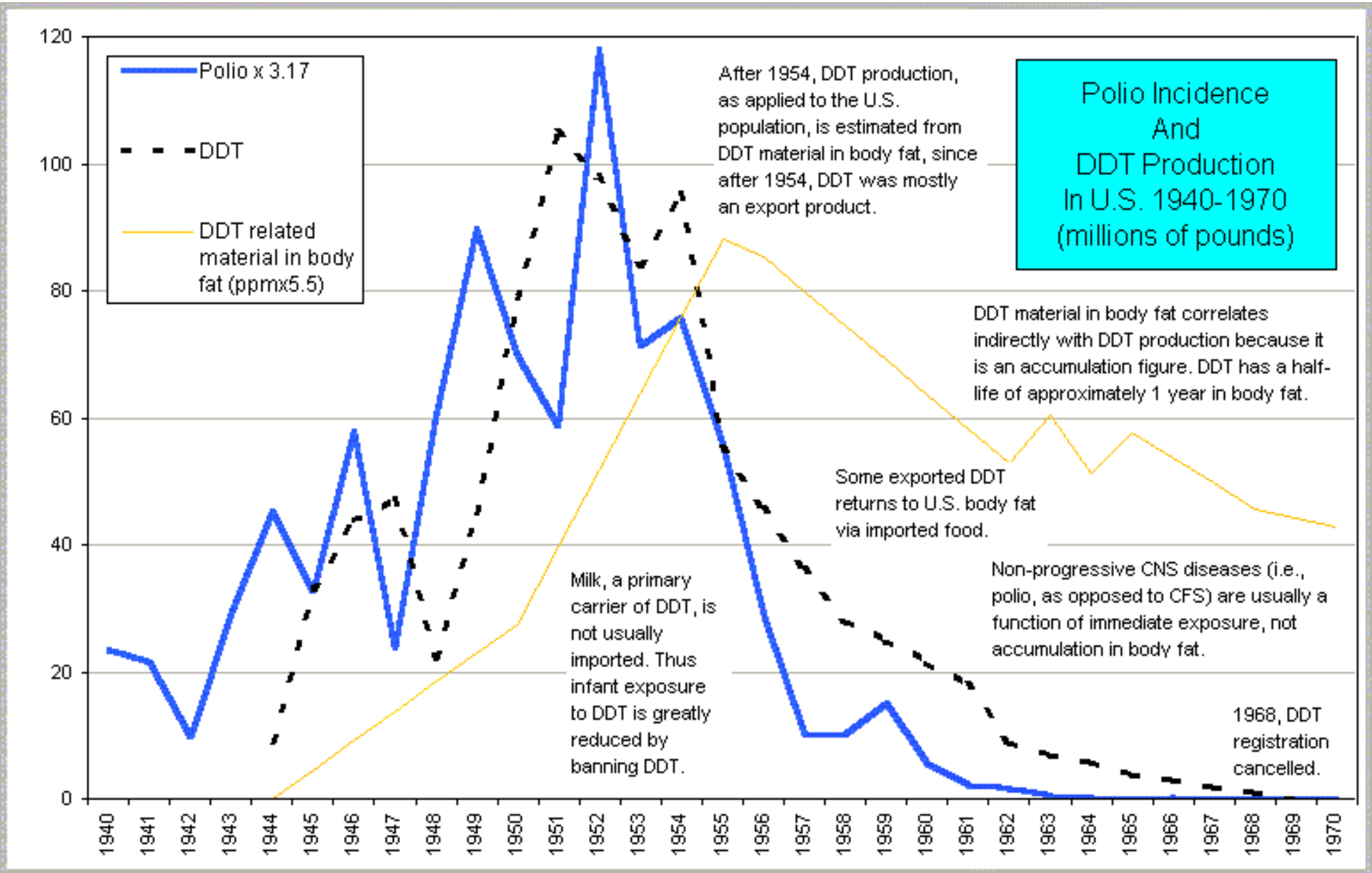


Hmmm—“Diseases”





Polio vs DDT


Polio x 3.17
DDT
DDT related material in body fat (ppmx5.5)
Polio Incidence And DDT Production In U.S. 1940-1970 (millions of pounds)
After 1954, DDT production, as applied to the U.S. population, is estimated from DDT material in body fat, since after 1954, DDT was mostly an export product.
DDT material in body fat correlates indirectly with DDT production because it is an accumulation figure. DDT has a half-life of approximately 1 year in body fat.
Some exported DDT returns to U.S. body fat via imported food.
Non-progressive CNS diseases (i.e., polio, as opposed to CFS) are usually a function of immediate exposure, not accumulation in body fat.
Milk, a primary carrier of DDT, is not usually imported. Thus infant exposure to DDT is greatly reduced by banning DDT.
1968, DDT registration cancelled.
120
100
80
60
40
20
0
1940
1941
1942
1943
1944
1945
1946
1947
1948
1949
1950
1951
1952
1953
1954
1955
1956
1957
1958
1959
1960
1961
1962
1963
1964
1965
1966
1967
1968
1969
1970

Your Office is “Nature”

- Nature—infinite, interconnected variables & “miracles” are normal
- Holistic Generalist vs Expert

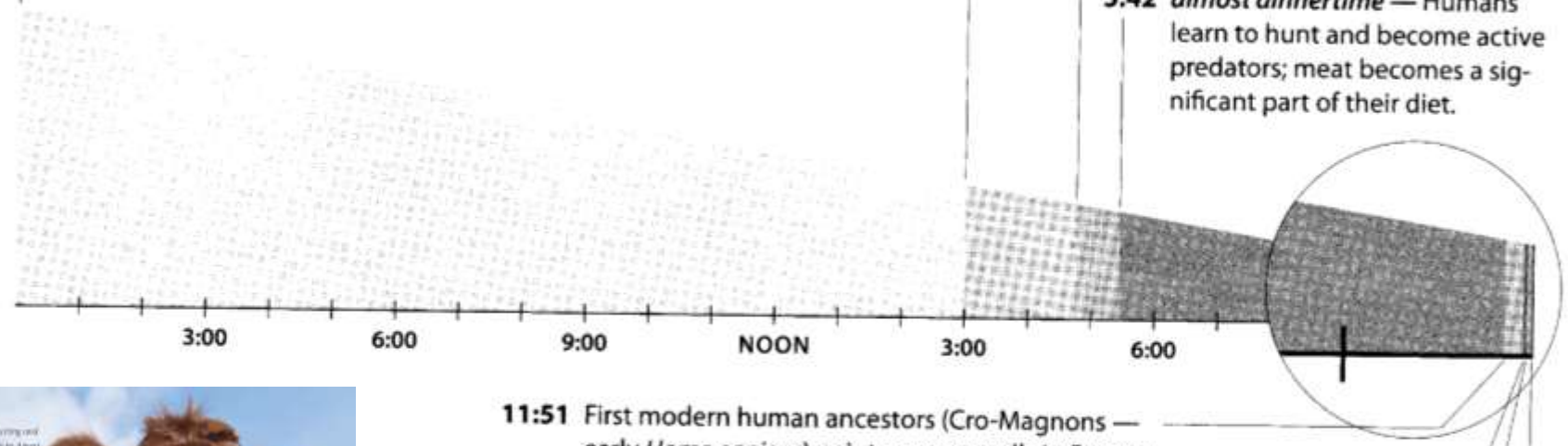
THE HISTORY OF MODERN LIVESTOCK COMPRESSED INTO 24 HOURS

12:01 ***just past midnight*** — Ancestors of cattle and other livestock are developing.

3:00 ***mid-afternoon*** — First humans start scavenging meat as small part of their diet.

4:45 The most recent cycle of great ice ages begins.

5:42 ***almost dinnertime*** — Humans learn to hunt and become active predators; meat becomes a significant part of their diet.

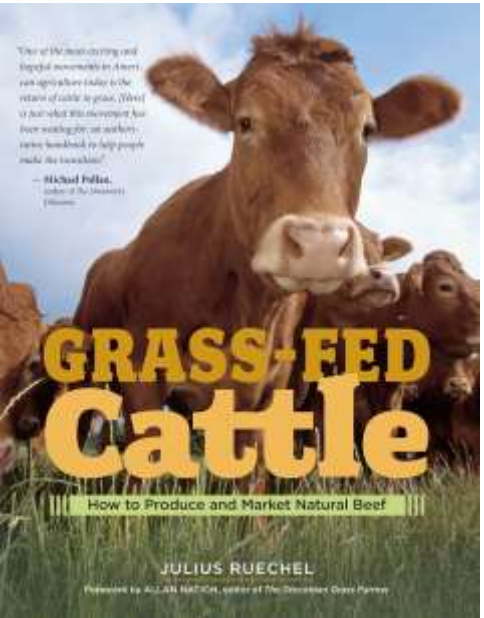


11:51 First modern human ancestors (Cro-Magnons — early *Homo sapiens*) paint on cave walls in France.

11:57 Last ice age ends; glaciers retreat; mammoths go extinct.

11:57:50 ***just over 2 minutes till midnight*** — Earliest known domestication of cattle, sheep, pigs, goats, and grains; transition from hunting culture to pastoralism and agriculture, from predator to shepherd and farmer.

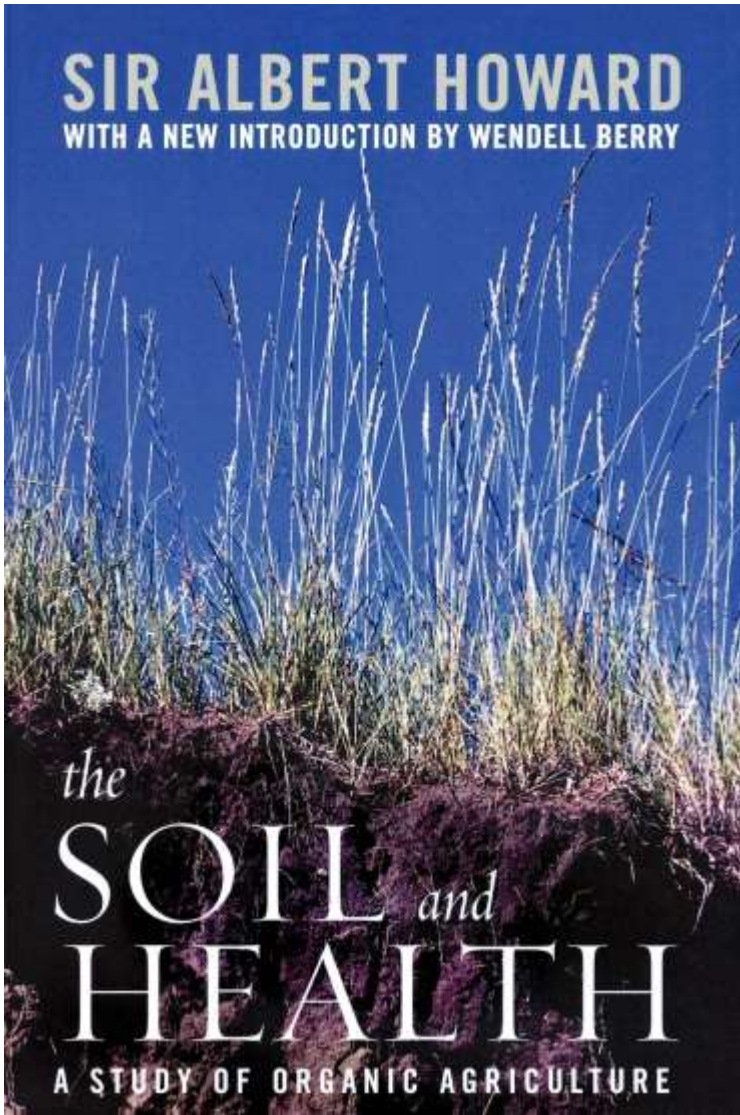
11:59:58.25 ***the last 1¾ seconds*** — Industrial Revolution; petrochemical industry; antibiotics, vaccines, pharmaceuticals; synthetic fertilizers; grain surpluses become animal feed; the feedlot industry emerges.



Sir Albert Howard (1947)

- 1910: “Healthy, well-fed animals failed to react to this disease…”

- **Nutrient Density Again!**



Is it Nutrient Dense?

- Taste
- $20 Brix Meter/Refractometer
- Dr Carey Reams (1903-1985)

Refractive Index of Crop Juices -- Calibrated In % Sucrose Or ºBrix

	Poor	Average	Good	Excellent
FRUITS				
Apples	6	10	14	18
Avocados	4	6	8	10
Bananas	8	10	12	14
Blueberries	8	12	14	18
Cantaloupe	8	12	14	16
Casaba	8	10	12	14
Cherries	6	8	14	16
Coconut	8	10	12	14
Grapes	8	12	16	20
Grapefruit	6	10	14	18
Honeydew	8	10	12	14
Kumquat	4	6	8	10
Lemons	4	6	8	12
Limes	4	6	10	12
Mangos	4	6	10	14
Oranges	6	10	16	20
Papayas	6	10	18	22
Peaches	6	10	14	18
Pears	6	10	12	14
Pineapple	12	14	20	22
Raisins	60	70	75	80
Raspberries	6	8	12	14
Strawberries	6	8	12	14
Tomatoes	4	6	8	12
Watermelons	8	12	14	16
GRASSES				
Alfalfa	4	8	16	22
Grains	6	10	14	18
Sorghum	6	10	22	30

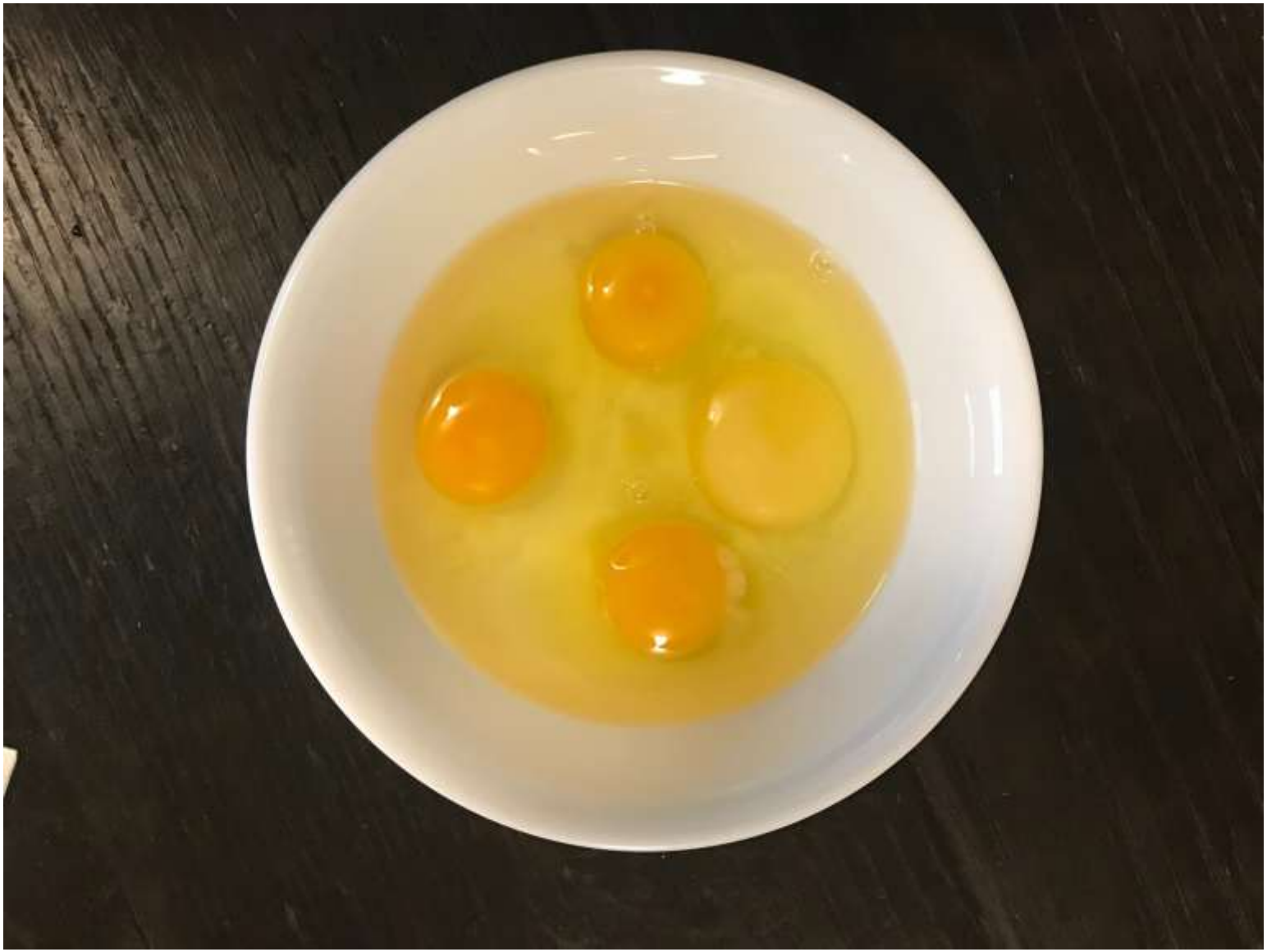
	Poor	Average	Good	Excellent
VEGETABLES				
Asparagus	2	4	6	8
Beets	6	8	10	12
Bell Peppers	4	6	8	12
Broccoli	6	8	10	12
Cabbage	6	8	10	12
Carrots	4	6	12	18
Cauliflower	4	6	8	10
Celery	4	6	10	12
Corn Stalks	4	8	14	20
Corn (Young)	6	10	18	24
Cow Peas	4	6	10	12
Cucumbers	2	3	4	5
Endives	4	6	8	10
English Peas	8	10	12	14
Escarole	4	6	8	10
Field Peas	4	6	10	12
Garlic, Cured	28	32	36	40
Green Beans	4	6	8	10
Hot Peppers	4	6	8	10
Kale	8	10	12	16
Kohlrabi	6	8	10	12
Lettuce	4	6	8	10
Onions	4	6	8	10
Parsley	4	6	8	10
Peanuts	4	6	8	10
Potatoes	3	5	7	8
Potatoes, Sweet	6	8	10	14
Romaine	4	6	8	10
Rutabagas	4	6	10	12
Spinach	6	8	10	12
Squash	6	8	12	14
Sweet Corn	6	10	18	24
Turnips	4	6	8	10

Within a given species of plant, the crop with the higher refractive index will have a higher sugar content, higher mineral content, higher protein content and a greater specific gravity or density. This adds up to a sweeter tasting, more minerally nutritious food with lower nitrate and water content, lower freezing point, and better storage attributes.

DATE	ITEM	SOURCE	BRIX		POOR	AVERAGE	GOOD	EXCELLENT
NA	Distilled Water		0					
2-Apr-23	Organic Spring Mix	Kroger	2		4	6	8	10
2-Apr-23	Organic Living Butter Lettuce	Kroger	2		4	6	8	10
2-Apr-23	Organic Honeycrisp Apple	Kroger	11.5		6	10	14	18
4-Oct-23	Sweet 100 Tomato	Garden	10		4	6	8	12
18-Jan-24	Organic Fuji Apple	Kroger	15		6	10	14	18
24-Jan-24	Non Organic Mandarine Orange	Kroger	15.5		6	10	16	20
16-Apr-24	Black Seeded Simpson Leaf Lettuce	Garden	6		4	6	8	10
24-Apr-24	Organic Mandarine Orange	Kroger	8		6	10	16	20
27-Aug-24	Cherry Tomato Lasagna	Garden	11.5		4	6	8	12
29-Aug-24	Fuji Apple	Garden	18.5		6	10	14	18
29-Aug-24	Grape Tomato Lasagna	Garden	10		4	6	8	12
8-Oct-24	Organic Grape Tomato	Kroger	4.5		4	6	8	12
18-Apr-25	Spinach	Garden	6		6	8	10	12
26-Apr-25	Spinach	Garden	10		6	8	10	12

	Kroger
	Garden
	Conventional vs Organic

You Are What You Eat Eats Too

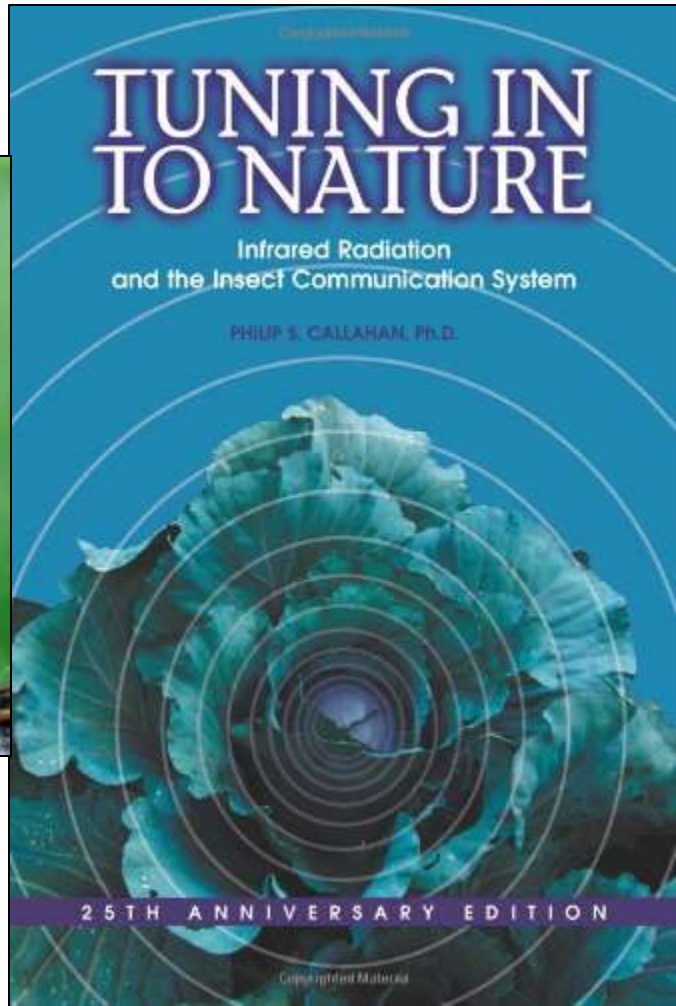


Soil to Grass to Beef to Me

HOLISTIC
LIVESTOCK
SUPPLY

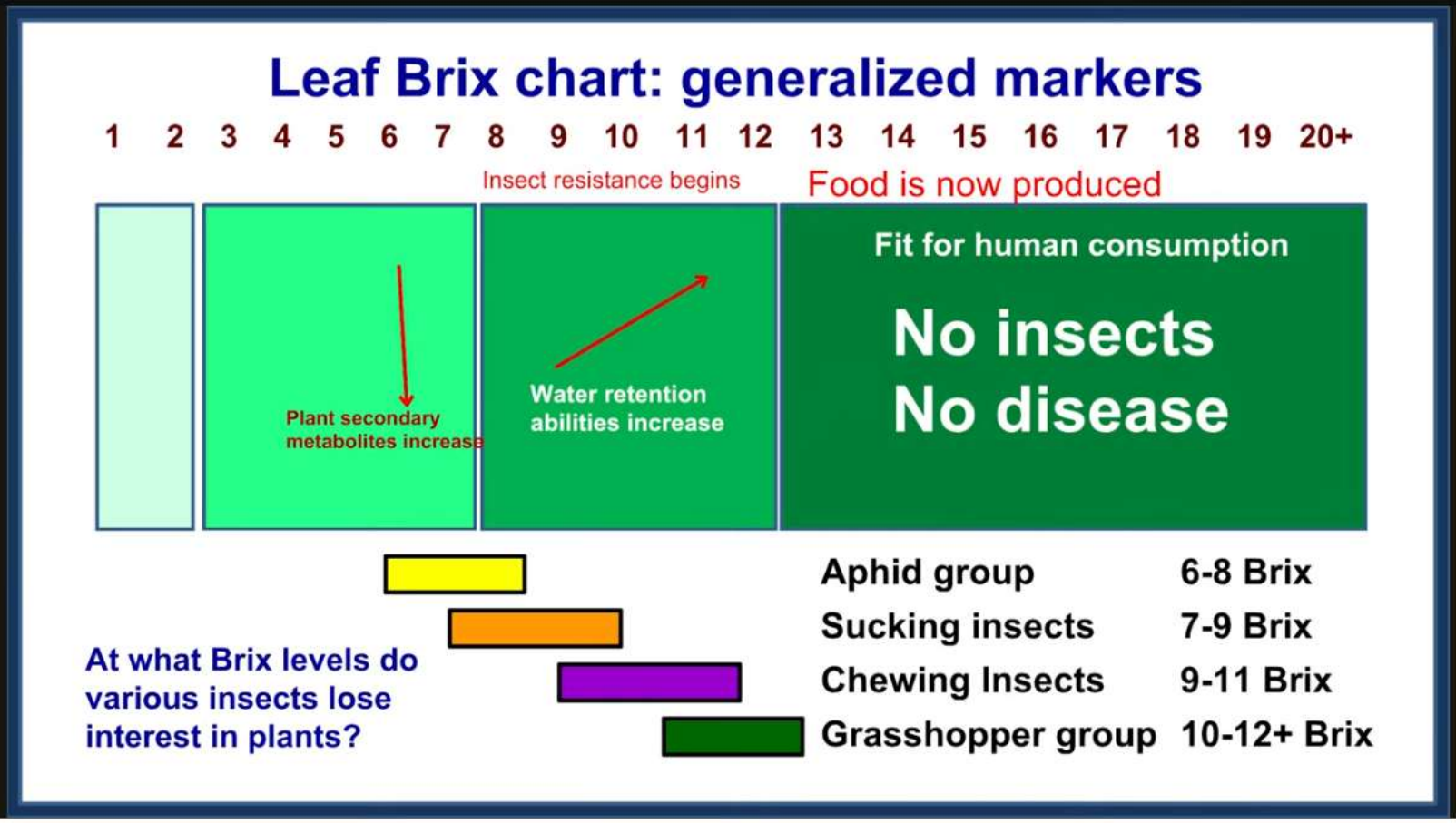
Nutrient Density & Insects

- Nature's garbage collectors
  - Sick plants radiate off-frequency
  - Get Brix ≥ 12



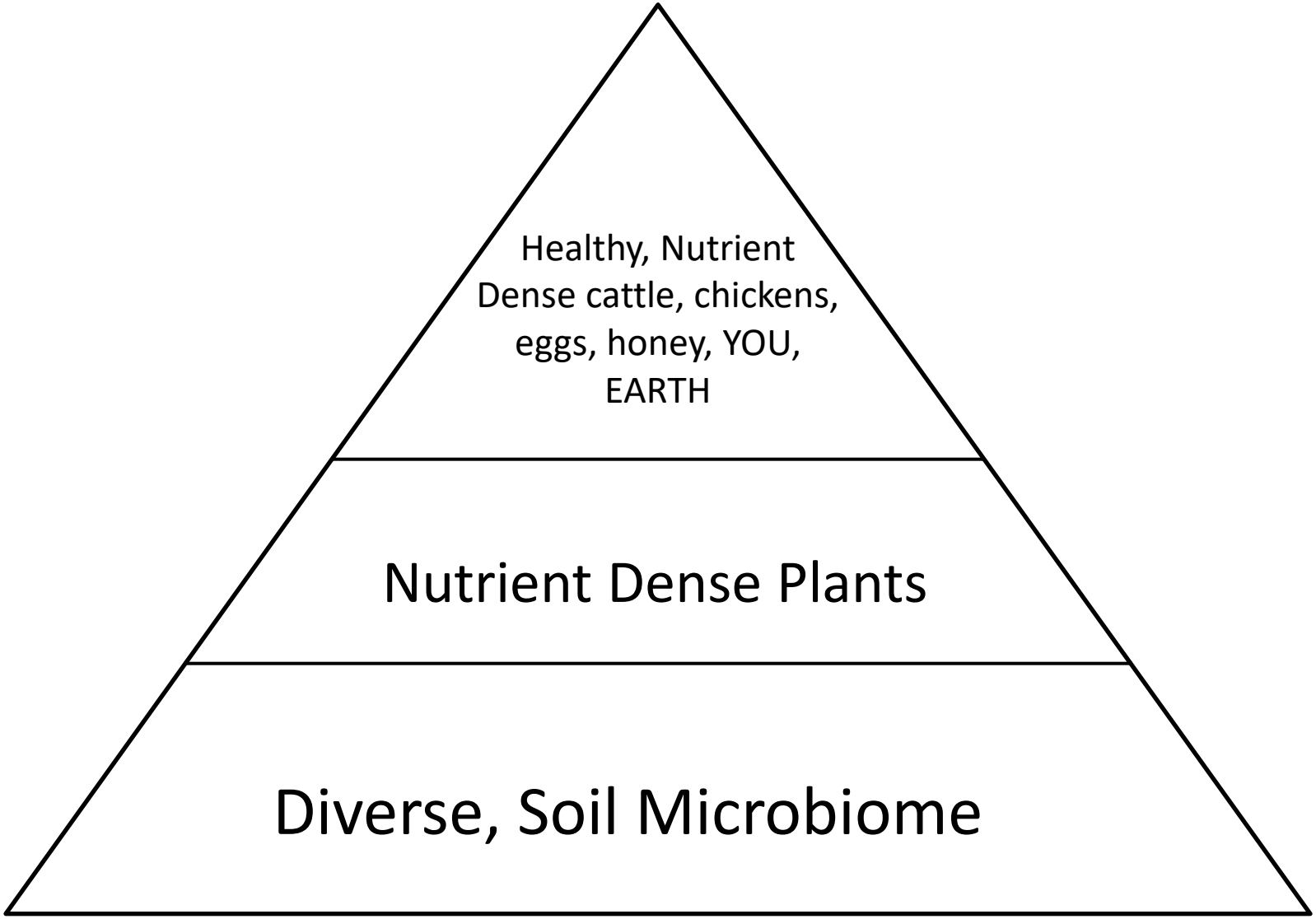
Dr Tom Dykstra

“Insects only feed upon food that is considered unfit, nutritionally poor, dead or dying”



Dr. Tom Dykstra | Raising and Lowering Brix Pt.1

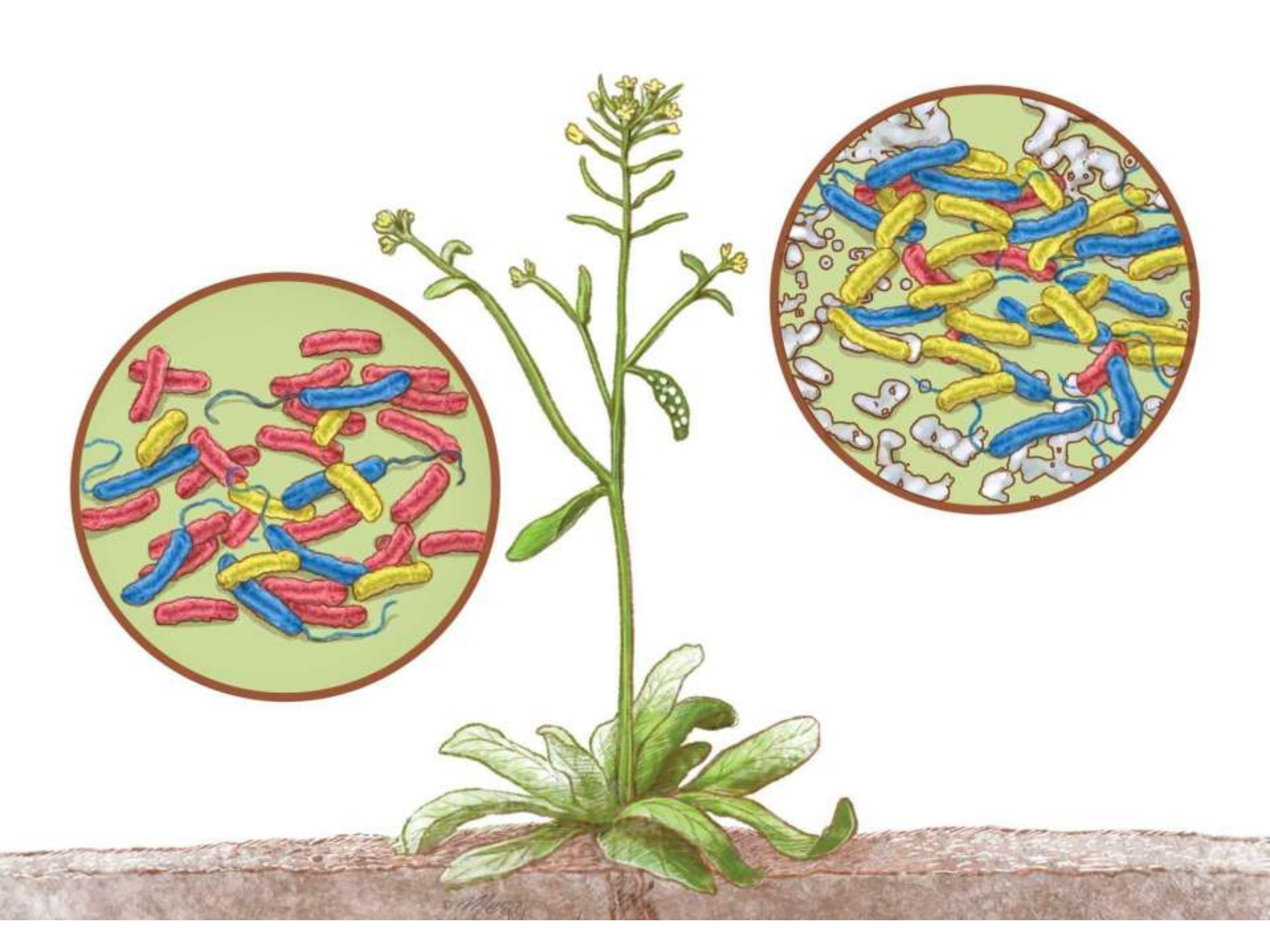
The Foundation--Microbiome



Team Effort!

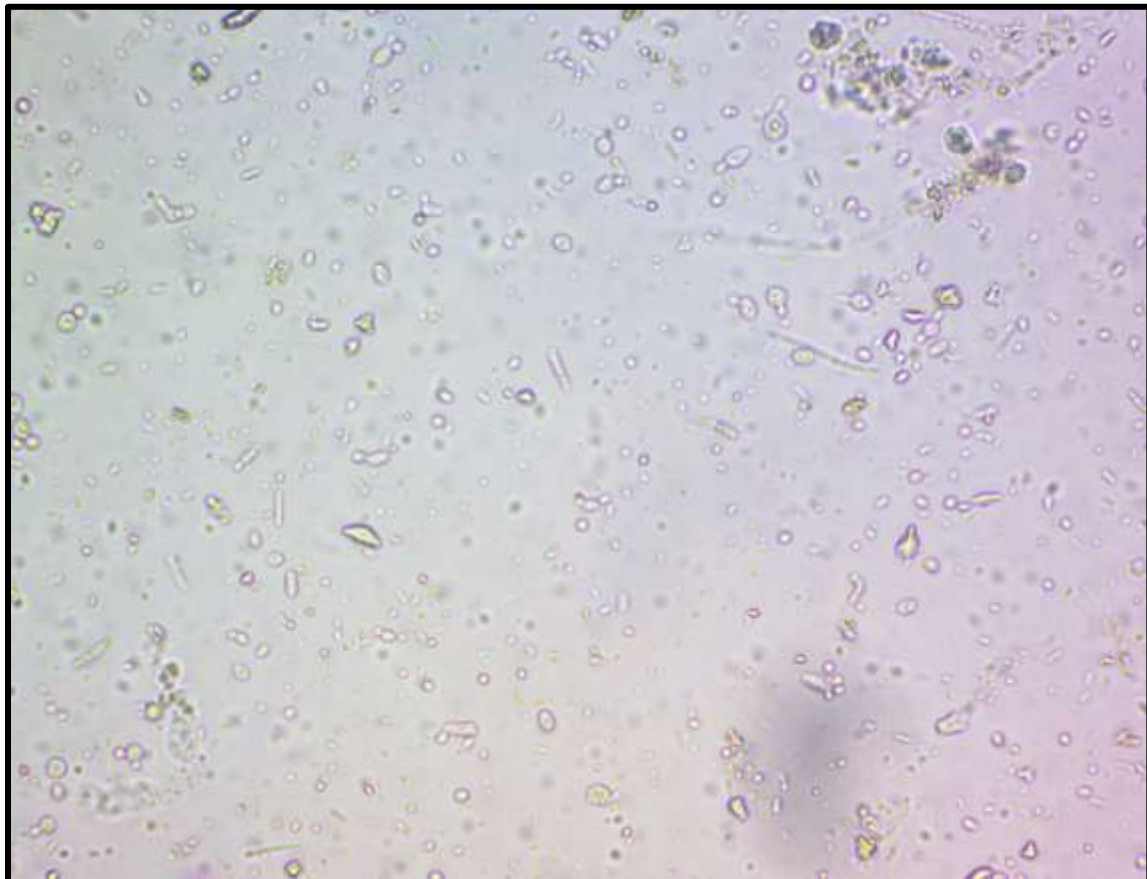
- Biology—microbiome workers
  - Leverage chemistry & physics to care for the plant
- Chemistry—minerals & chemical reactions
  - Ca, P, K, NO3, NH4
- Physics—electrical energy
  - Sunlight, moonlight, + ions, - ions

What’s In This Stuff??



Bacteria

- Recycle simple organic matter
  - Manure, alfalfa, green grass (Green, high nitrogen)
  - Fix nitrogen



Fungi

- Recycle more complex organic matter
  - Wood chips, leaves, straw, etc (woody, high Carbon)

Photo Source: Israel Chemicals Limited Growing Solutions

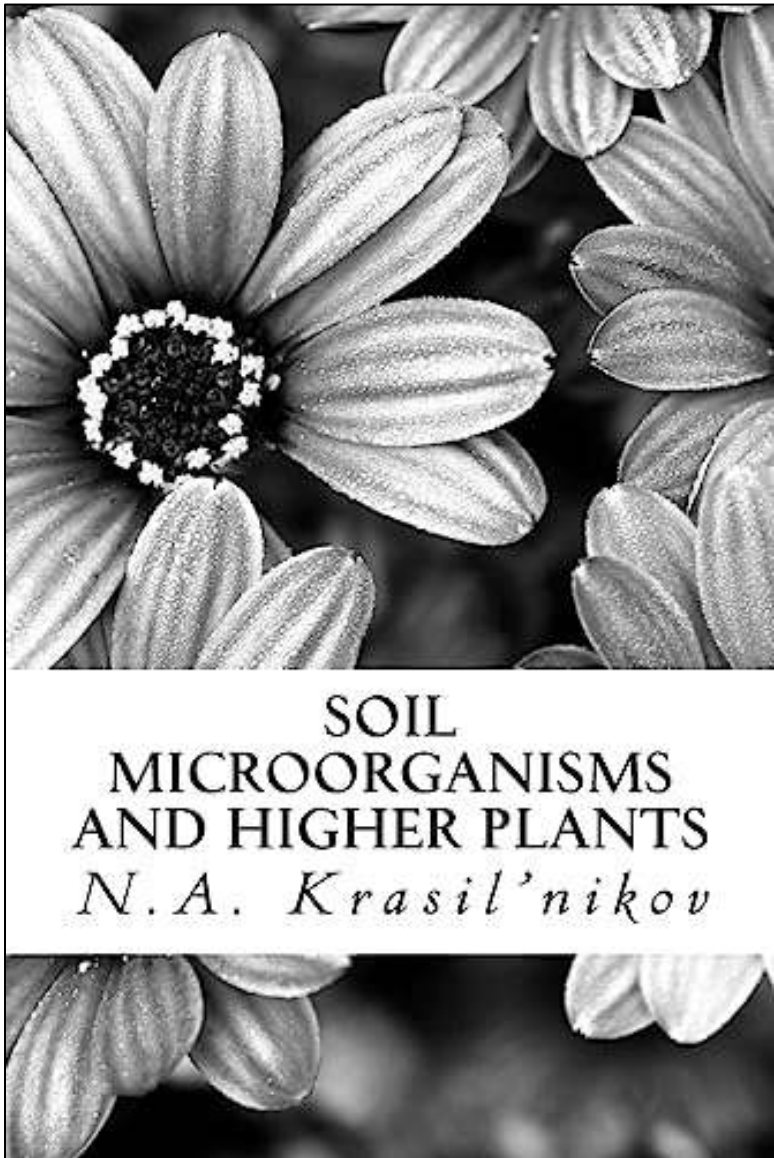
Protozoa--Predator

Nematodes--Predator

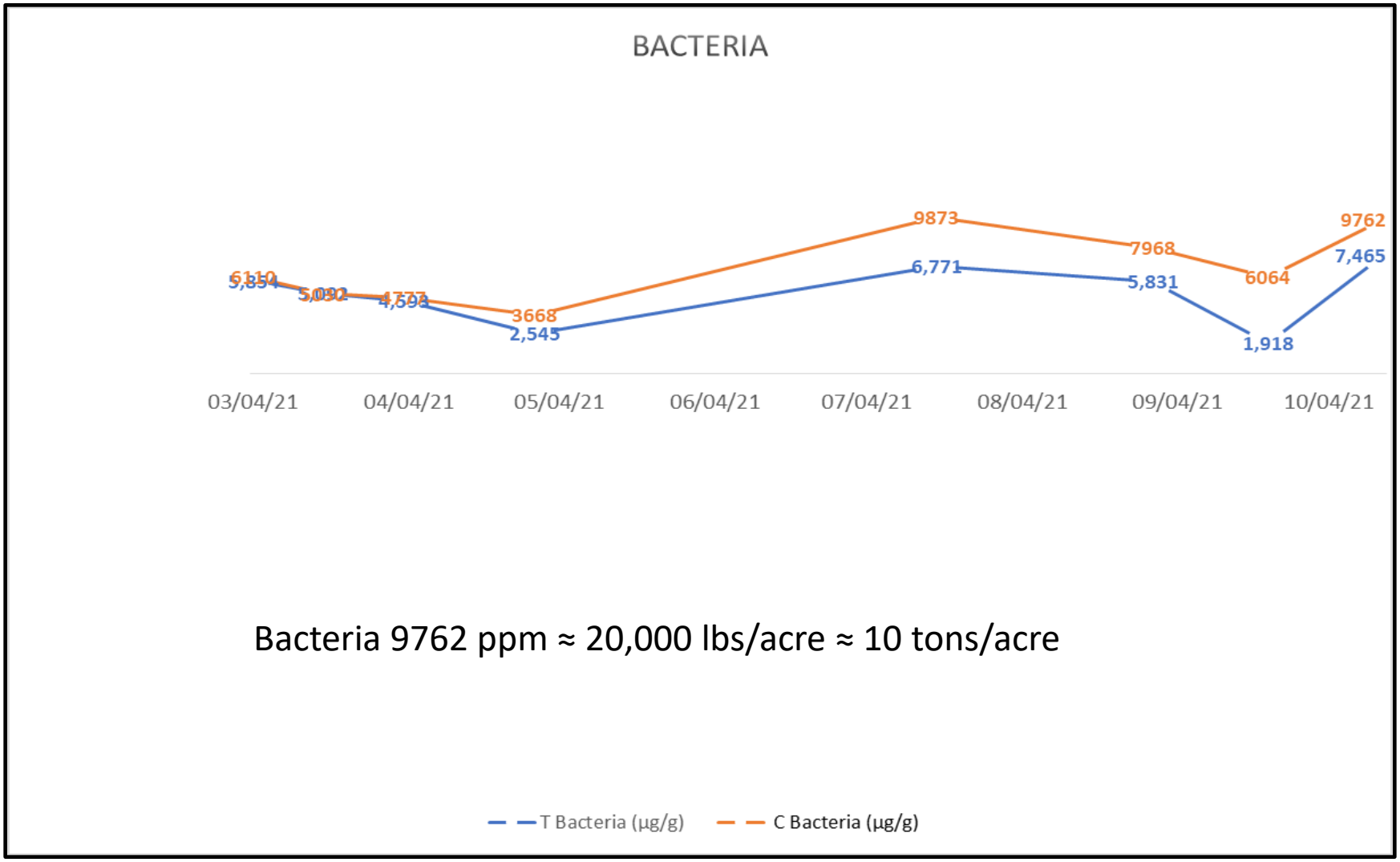
There's So Much More!

- 3.5-4.5 tons Bacteria/acre

- Reproduce 6-10x/season
- Team Bacteria/Fungi/Algae
  - Auxins (Growth Hormones)
  - Alpha & Beta Carotenes
  - Vitamins $B_{1,2,3,6,7,9,12}$, C/D/K
  - Enzymes
  - Amino Acids
  - Antibiotics
  - **Need Diversity & Balance!!!!**

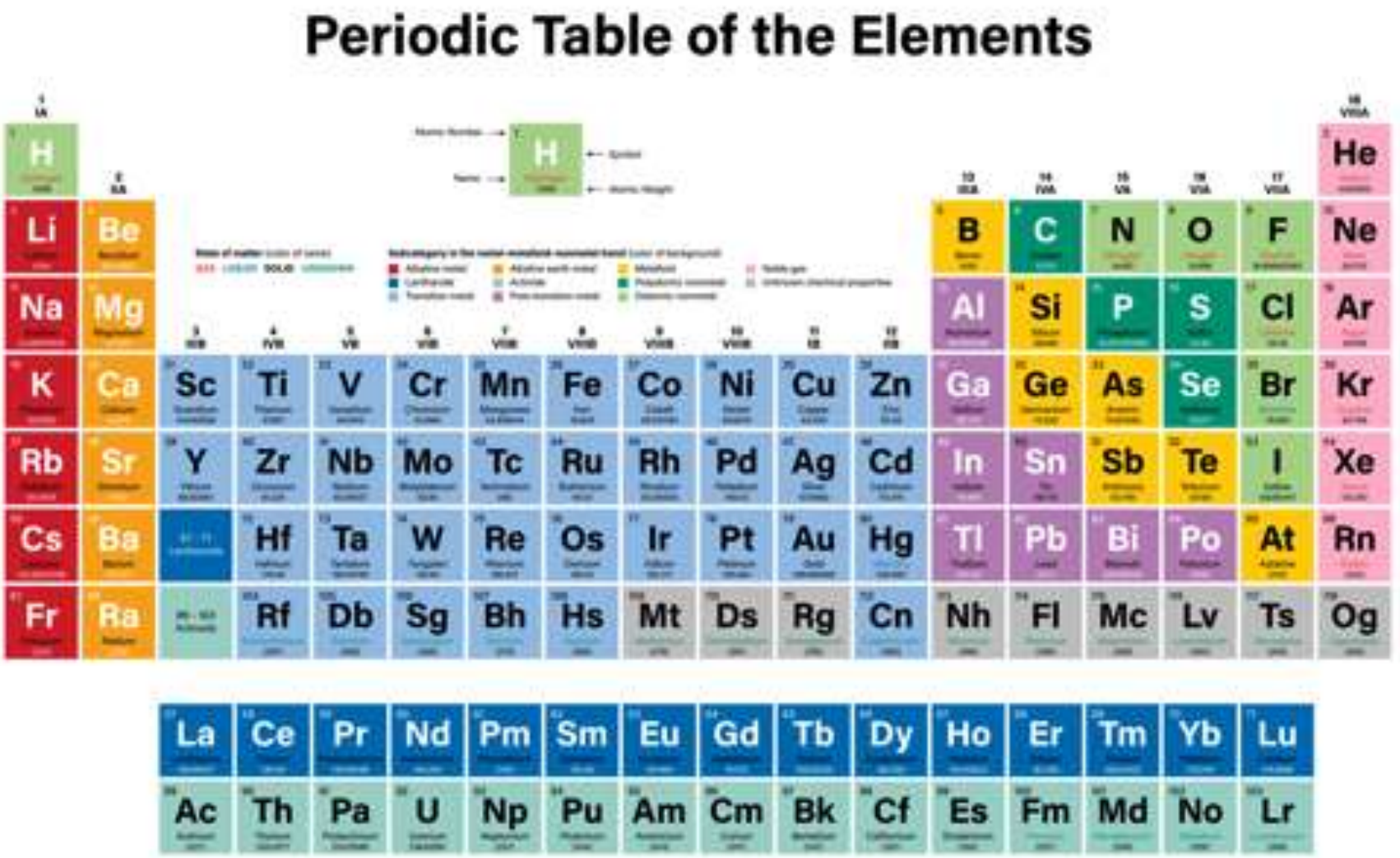


Pasture Testing Bacteria



Bacteria 9762 ppm ≈ 20,000 lbs/acre ≈ 10 tons/acre

Chemistry

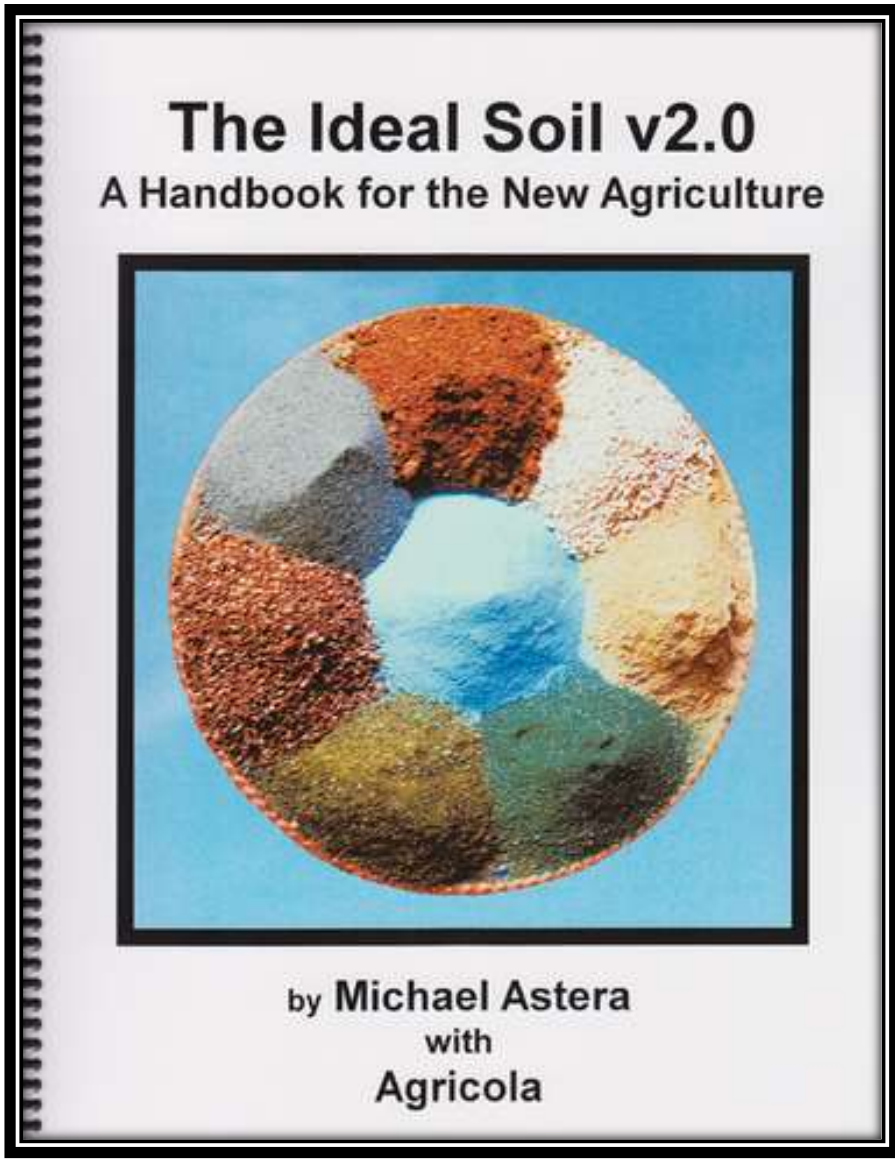

Periodic Table of the Elements
H
He
Li
Be
B
C
N
O
F
Ne
Na
Mg
Al
Si
P
S
Cl
Ar
K
Ca
Sc
Ti
V
Cr
Mn
Fe
Co
Ni
Cu
Zn
Ga
Ge
As
Se
Br
Kr
Rb
Sr
Y
Zr
Nb
Mo
Tc
Ru
Rh
Pd
Ag
Cd
In
Sn
Sb
Te
I
Xe
Cs
Ba
Hf
Ta
W
Re
Os
Ir
Pt
Au
Hg
Tl
Pb
Bi
Po
At
Rn
Fr
Ra
Rf
Db
Sg
Bh
Hs
Mt
Ds
Rg
Cn
Nh
Fl
Mc
Lv
Ts
Og
La
Ce
Pr
Nd
Pm
Sm
Eu
Gd
Tb
Dy
Ho
Er
Tm
Yb
Lu
Ac
Th
Pa
U
Np
Pu
Am
Cm
Bk
Cf
Es
Fm
Md
No
Lr

Dr William Albrecht

<u>University of Missouri</u>

1920s-1960s

"…I could help more people through soil science because of the link to health than I could from becoming a medical doctor."



The Ideal Soil Chart (Agricola's Best Guess v 2.0 January 2014)

Based on a Soil Test using the Mehlich 3 method

Organic Matter (OM)	2% — 10%	Depending on climate
pH	6.4 – 6.5	Balance the minerals and pH will take care of itself

Primary Cations as % of Cation Exchange Capacity (CEC) **See appendix "Calculating TCEC" p 125**

Calcium (Ca)++ min 750ppm	60% — 85% (Ideal 68%)	Ca & Mg together should add to 80% of exchange capacity in most agricultural soils pH 7 and lower
Magnesium (Mg)++ min 100ppm	10% — 20% (Ideal 12%)	
Potassium (K)+ min 100ppm	2% — 5% (Ideal 4%)	See Phosphorus (P)
Sodium (Na)+ min 25ppm	1% — 4% (Ideal 1.5%)	Essential for humans and animals
Hydrogen (H)+	5% — 10% (Ideal 10%)	A lone proton. The "free agent"

Primary Anions

Phosphorus P- min 100ppm	P = **Ideal** K by weight (ppm) **BUT: phosphate** (P_2O_5) should be **~2X potash** (K_2O)	Needs a highly bio-active soil to keep it available.
Sulfur S - - min 50 ppm	1/2 x **Ideal** K up to 300 ppm	Need for Sulfur amino acids Conserves soil N and Carbon

Secondary elements

Iron(Fe) + min 50ppm Manganese(Mn) + min 25ppm Zinc (Zn) + min 10ppm Copper (Cu) + min 5ppm	Fe: 1/3 to 1/2 x **Ideal** K Mn: 1/3 to 1/2 x Fe **Zn: 1/10 x P** (up to 50ppm) Cu: 1/2 x Zn (up to 25ppm)	Iron and Manganese are twins/opposites and synergists, as are Copper and Zinc.
Boron $B^{3+ \text{ or } -}$ (cation or anion) min 1ppm	1/1000 of Calcium (max 4 ppm)	Essential for Calcium utilization. Calcium transports sugars
Chlorine (Cl)- min 25ppm	1x to 2x Sodium	Essential, but ages clays rapidly when used in large amounts
Silicon $Si^{4+ \text{ or } -}$ (cation or anion)	Ideal unknown. Si is the most abundant mineral in most soils. Active soil biology and balanced mineral chemistry will ensure availability.	

Micro (trace) Elements

Chromium Cr- Cobalt (Co)+ Iodine (I)- Molybdenum Mo- Selenium (Se)- Tin (Sn)+ Vanadium (V) + Nickel (Ni) + Fluorine (F) –	All of these are essential in small amounts. 0.5 - 2ppm is enough. Some of the micro elements (e.g. Mo, Se) can be toxic to plants and soil organisms in quantities above 1-2ppm. Use Caution when applying micro/trace elements in purified forms	There are probably 30 or so other elements needed to grow fully nutritious food. Sources are amendments such as seaweed, rock dust, ancient seabed or volcanic deposits, rock phosphate, greensand etc

Plants need at least 17 of the 23 elements listed above, as well as Nitrogen, Carbon, Hydrogen, and Oxygen.

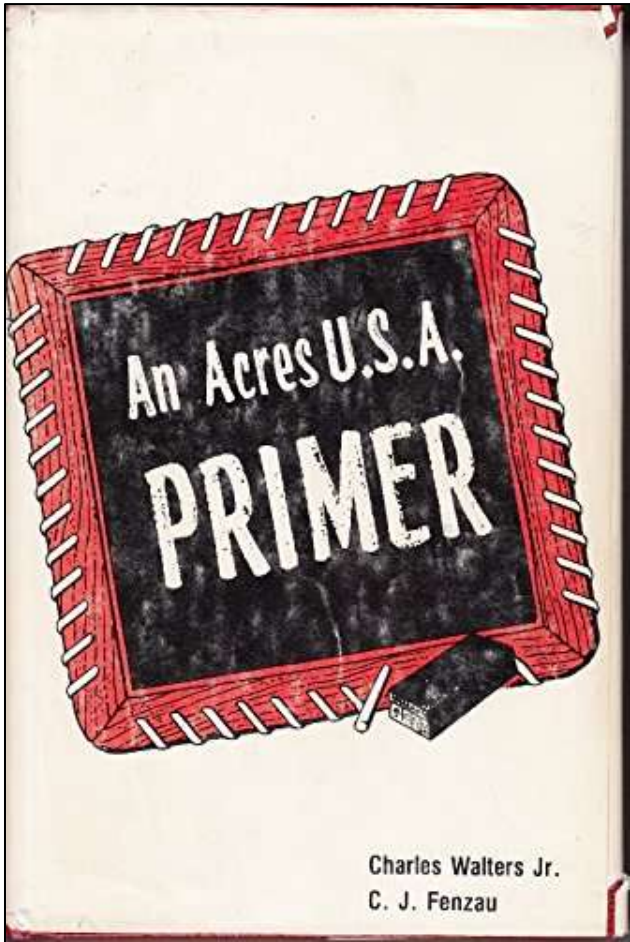
Cation Exchange Capacity

- **CEC: Measure of soil's ability to hold and release various elements and compounds**
  - **Milligram equivalents (meq)**

- Dirt to Soil: 1-80 meq (p 121 Primer)

- Sand/Gravel: 0 meq
- Clay: 10-80 meq
- Humus: 100-200 meq

- Biochar: 22-138 meq (p 105 Ideal)



Biochar

- Like charcoal, but pyrolysis process
- Not a fertilizer but a facilitator
  - "Coral Reef" for microbes & minerals
- Terra Preta soils in Amazon Basin (213 meq)

Mehlich 3 (pH 2.5)

Lab Number: 602069 **Sample Name:** TEST2 **Farm Name:**

Soil Results

pH		Phosphorus	Potassium	Calcium	Magnesium	Zinc	Iron	Manganese	Boron	Sodium
Soil pH	Buffer Value	P	K	Ca	Mg	Zn	Fe	Mn	B	Na
		Pounds per acre - Mehlich 1								
6.65		25 M	84 L	1842 S	140 S	2.3 S	17 S	20 S	0.5	12

Crop/plant Interpretation ranges on last sheet

L = Low, M= Medium, H=High, V= Very High, S = Sufficient

Additional tests, if they were requested											
Sulfur	Nitrogen			Carbon	C/N Ratio	Organic Matter	Soluble Salts	Particle Size Analysis - Hydrometer Method			
LBS/ACRE	NH4-N ppm	NO3-N ppm	Total N %	%	%	%	dS/m	% Sand	% Silt	% Clay	Soil Texture
						3.3	0.03	20	64	16	Silt Loam

Chemistry--Minerals

- Dr Carey Reams (1903-1985)
  - Calcium: 2000 (lbs/acre)
  - Phosphorus: 400
  - Potassium: 200
  - Sulphur: 200
  - Nitrates: 300
  - Ammonium: 40
  - Iron: 40

Morgan (pH 4.8)

INTERNATIONAL AG LABS
A BIOLOGICAL APPROACH TO AGRICULTURE
PHONE 507-235-6909 FAX 507-235-9155 P.O. BOX 788 FAIRMONT, MN 56031

NAME:	Kevin Krause	**DATE:**	02/12/24
		SAMPLE TESTED:	TA1 Bottom Bio/Clean
ADDRESS:	4447 Dry Fork Road	**Plot Size:**	1 Acre **Sq. Ft.**
CITY/STATE:	Hampshire, TN 38461	**2023 CROP GROWN:**	Very Little Bermuda
		2024 CROP:	Mix Clover, Chicory, Brome
		LAB TEST#	**299**

SOIL ANALYSIS REPORT

	UNIT	DESIRED RATIO	DESIRED LEVEL	LAB RESULTS
HUMUS			30-40	3
NITRATES	lbs. / Acre		40	8
AMMONIA	lbs. / Acre		40	6
PHOSPHORUS	lbs. / Acre	1P:1K	174	7
POTASSIUM	lbs. / Acre		167	214
CALCIUM	lbs. / Acre	7 Ca : 1 Mg	3000	1104
MAGNESIUM	lbs. / Acre		429	68
SODIUM	PPM		<35	6
ERGS	µS / Centimeter		200	144
ORP			28	22
pH			6.5	5.7
COPPER	PPM		0.8-2.5	0.5
IRON	PPM		10 50	69.2
ZINC	PPM		1-6	2.1
MANGANESE	PPM		10 50	21.5
BORON	PPM		0.8-1.2	Not Tested
SULFUR	PPM		30	Not Tested
ORGANIC MATTER	%		4%	Not Tested
FORMAZAN	PPM		600	Not Tested

Soil Index

0.03 : 1 P to K Ratio

16.24 : 1 Ca to Mg Ratio

Broadcast:
1 ton Soft Rock Phosphate
1 ton Low Magnesium Limestone
500 lbs. Gypsum
125 lbs. 11-25-0
125 lbs. Ammonium Sulfate
50 lbs. Magnesium Sulfate
40 lbs. Copper Sulfate

When Cattle Are Removed in Fall Apply:
2 qt. Z-Hume
2 lbs. Dextrose
20 gallons water
Note: This will help jump start trash decomposition.

Mineral Sources

- Rock--Sand, Silt, Clay
- Rock dust (Soft Rock Phosphate, Basalt, Azomite)
- Blood meal & Bone meal
- Sea salt (90 minerals)
- Organic matter (leaves, wood chips, etc)
- Commercial products—Good & Bad (N, P, K)
  - Potash (Potassium Chloride)
    - 60-125 lbs/acre = 15-31 ppm Chlorine (2-4 ppm pool)

Typical Mineral Content of USDA Organic Fertilizer Ingredients (%)

Animal Source	N	P as P_2O_5	K as K_2O	S	Ca	Mg	Fe	Tr
Fish Bone	4	20		0.6	19	0.3		Tr
Fish Meal	10	4.5		0.6	2.3	0.3		Tr
Crab Shell	3	3.25	0.3	0.2	23	0.3		Tr
Blood Meal	13	1						
Feather Meal	12	0.1	0.4	0.4	0.6	0.6		
Bone Meal	3	15			20	0.4		

Mineral Amendments and Kelp

	N	P as P_2O_5	K as K_2O	S	Ca	Mg	Fe	Tr
Ag Lime					32-40	1-5		
Dolomite Lime					22	13		
Gypsum*				16	22			
Oyster shell					36	0.3		
Epsom salt**				14		10		
Potash sulfate**			51	17.5				
TN brown phos		3 (23% total)			40			Tr
Calphos		3 (20% total)			20			Tr
K Mag*			22	22		11		
Greensand		1	7		1.3	2.2	9	Tr
Kelp Meal	1	0.7	3	2	2	0.7		Tr

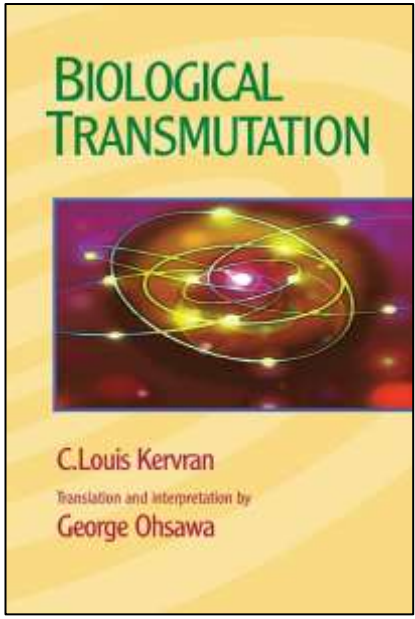
Tr = Good source of micro (trace) minerals

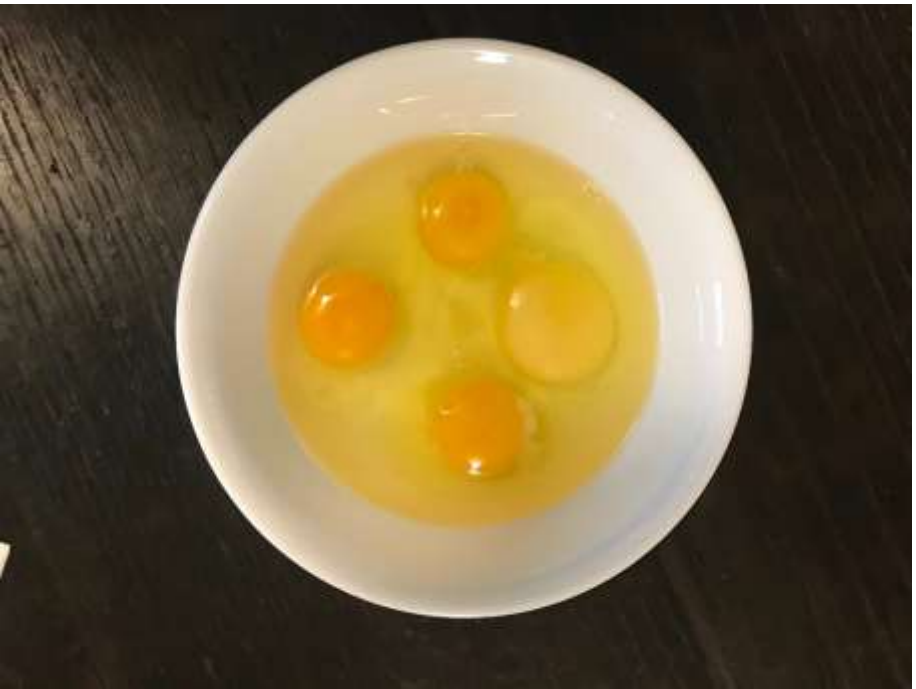
Purified Source	Sulfur S	Boron B	Iron Fe	Mang. Mn	Copper Cu	Zinc Zn
Ag Sulfur	**90-100**					
Borax**		**9**				
Solubor™**		**20.5**				
Fe sulfate $1H_2O$	**18**		**30**			
Fe sulfate $7H_2O$**	**11.5**		**20**			
Mn sulfate $1H_2O$*	**19**			**32**		
Cu sulfate $5H_2O$**	**12.5**				**25**	
Zinc sulfate $1H_2O$*	**17**					**35**
Zinc sulfate $7H_2O$**	**11**					**22**

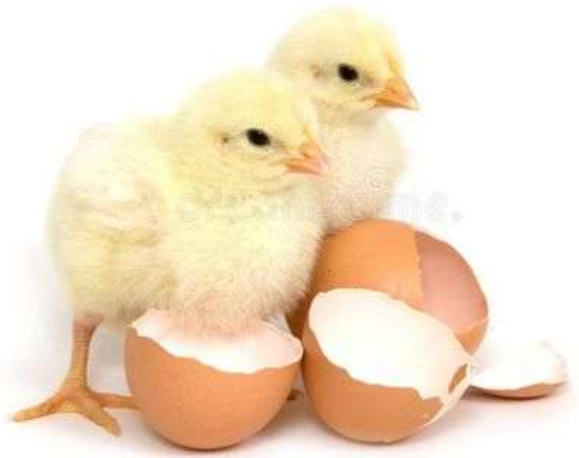
**Highly soluble in H_2O *Varies in solubility in H_2O

Biological Transmutation?

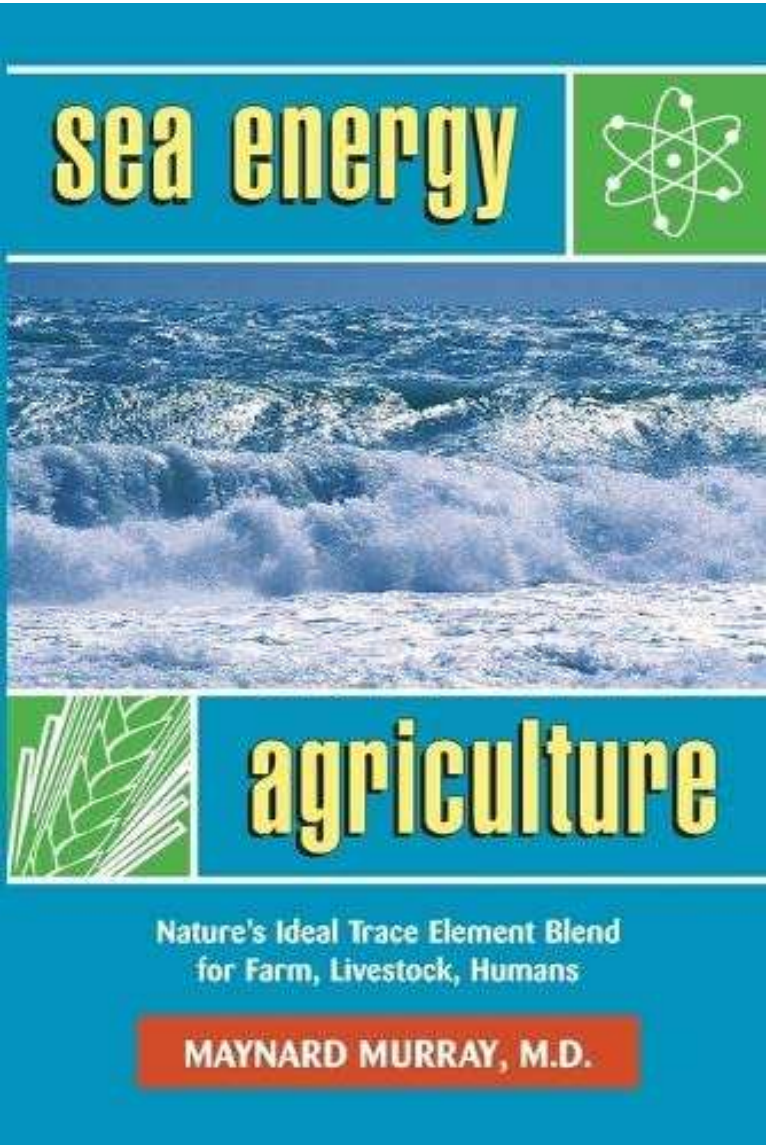
- Silicon to Calcium???







Sea Water Minerals



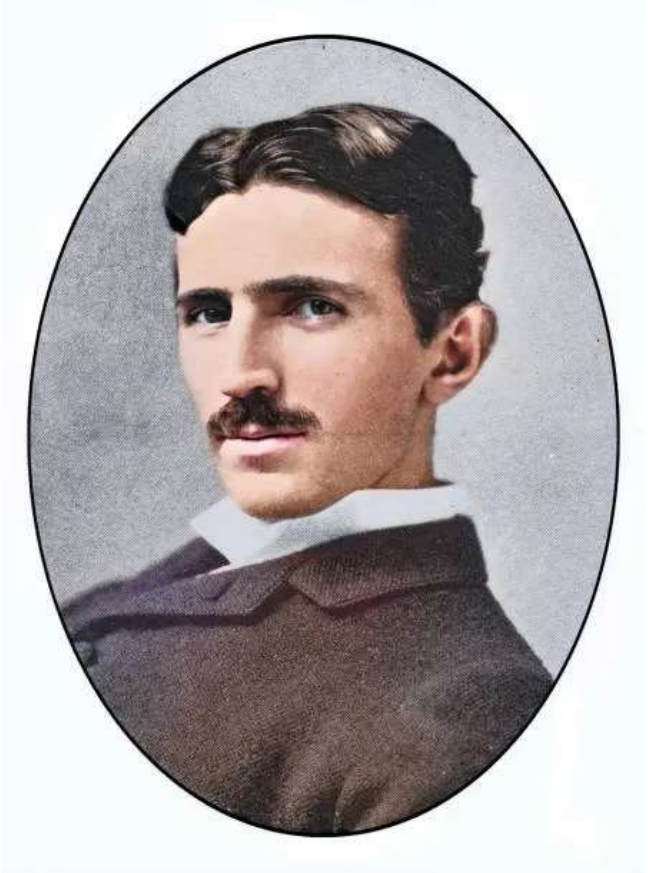
- Redmond or Sea 90
- 200-2200 lbs/acre

- HighBrixGardens.com
  - 43 lbs/acre
  - 43 oz/acre (water)

Physics

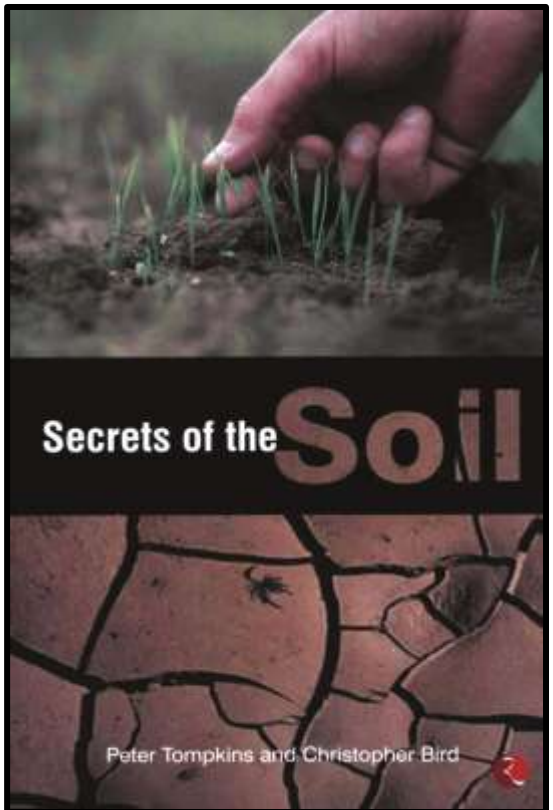
“If you want to find the secrets of the universe, think in terms of energy, frequency, and vibration.”

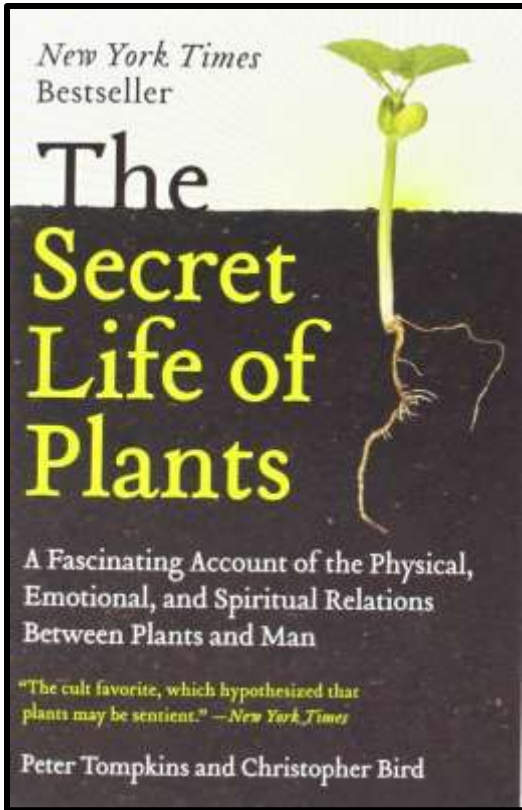
Nikola Tesla



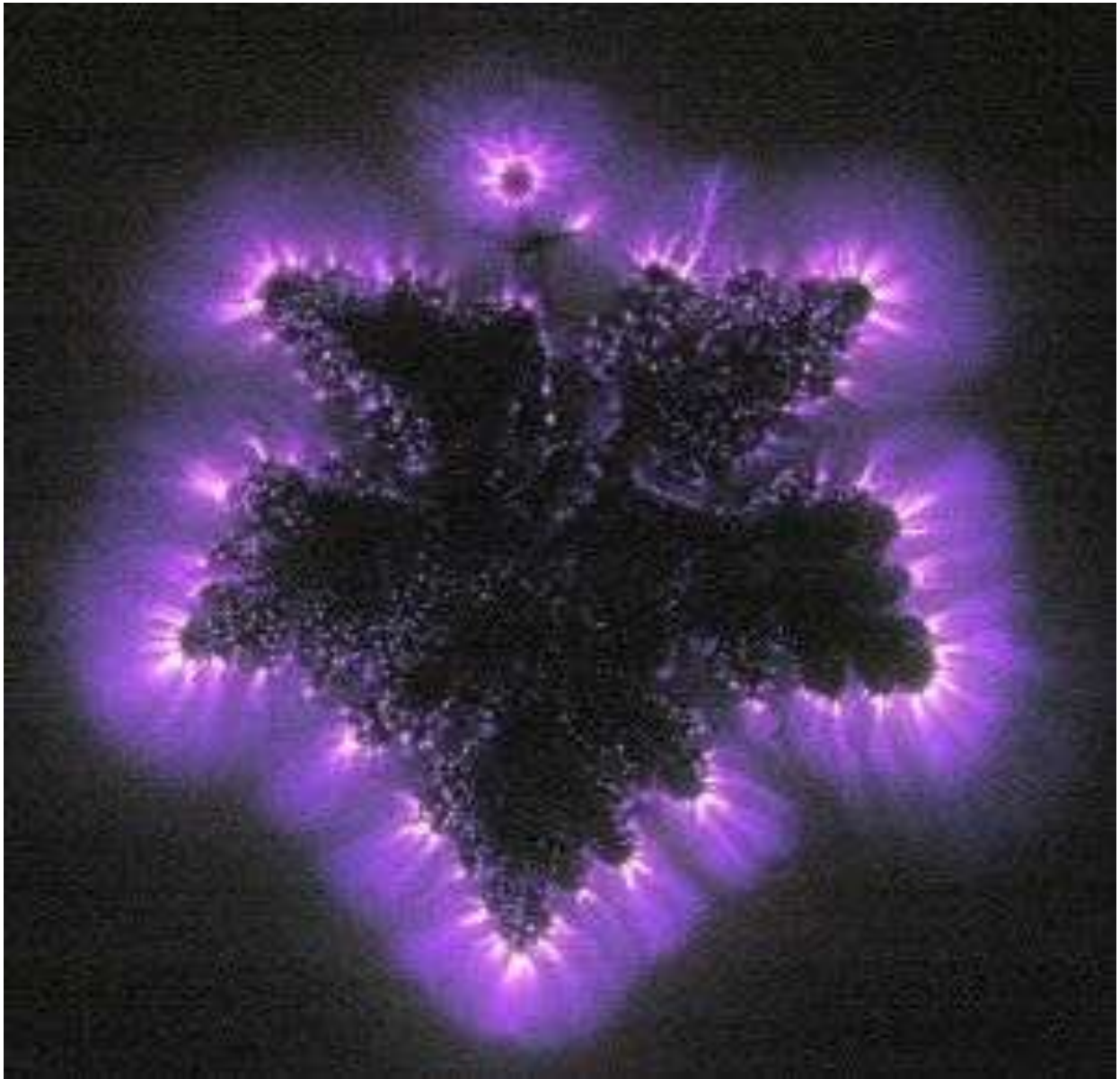
Physics

- Sun, Moon, Stars, Planets
- Earth's Magnetic Field (N/S)
- Song birds
- Music
- Your energy





“Kirlian” Leaf Photo



THE ORIGINAL FARMER'S ALMANAC
"USEFUL, WITH A PLEASANT DEGREE OF HUMOR"

"NEW, USEFUL, AND ENTERTAINING MATTER" · ALMANAC.COM

NO. 234

THE OLD FARMER'S 2026 ALMANAC®

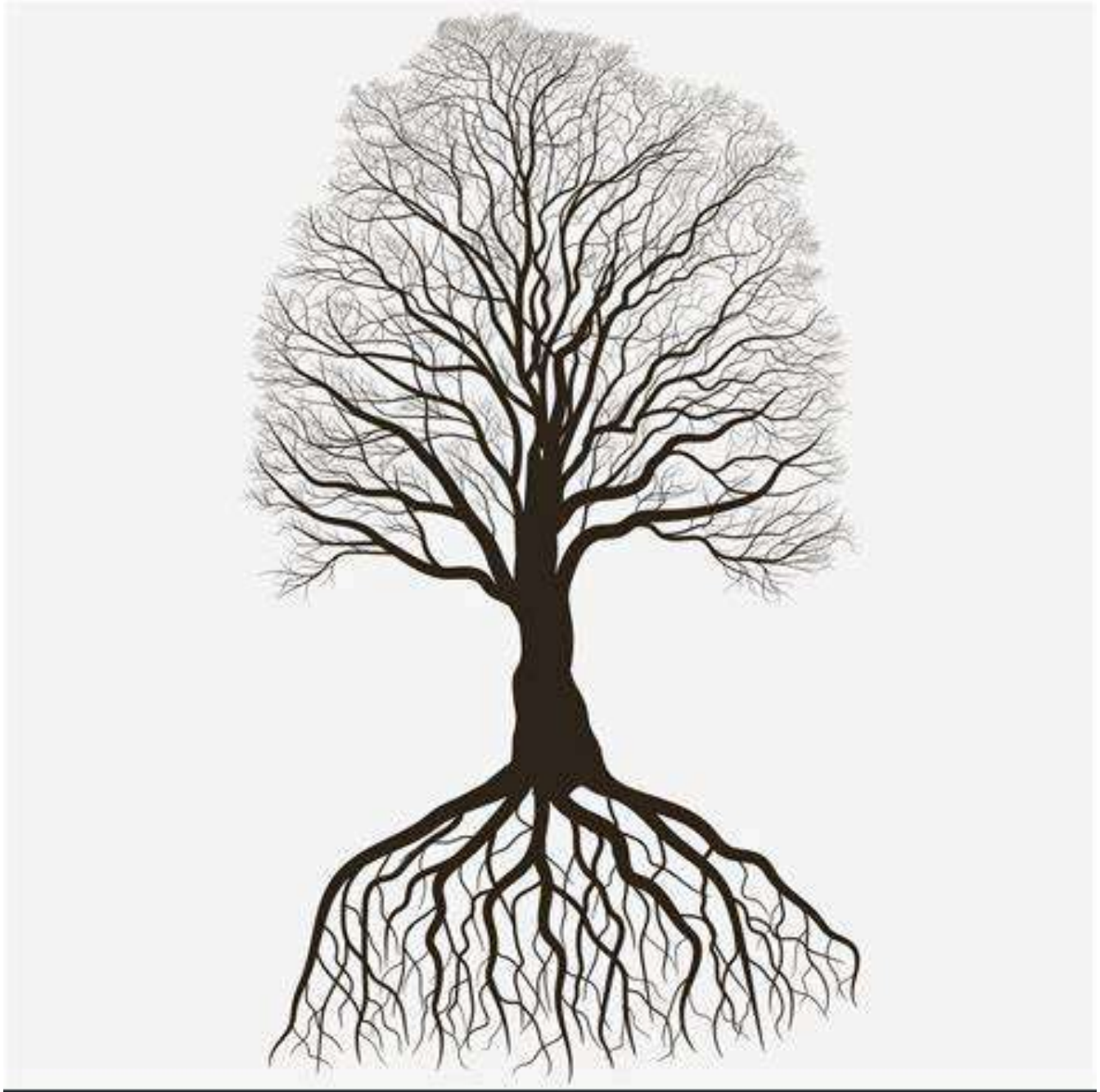
ROBERT B. THOMAS

FOUNDED IN 1792

ALSO FEATURING ASTRONOMICAL TABLES, TIDES, HOLIDAYS, ECLIPSES, ETC.

WEATHER FORECASTS
FOR 18 REGIONS OF THE UNITED STATES

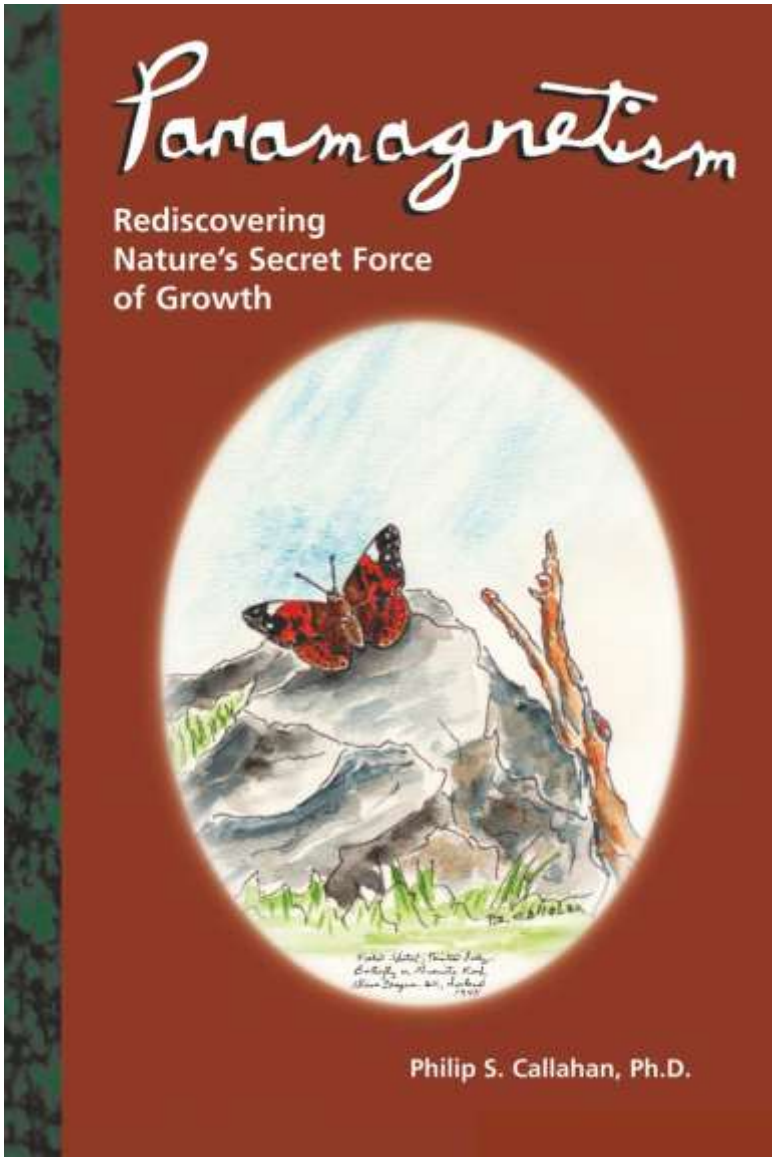
SUN, MOON, STARS, AND PLANETS



Tree Roots to Magnetic North

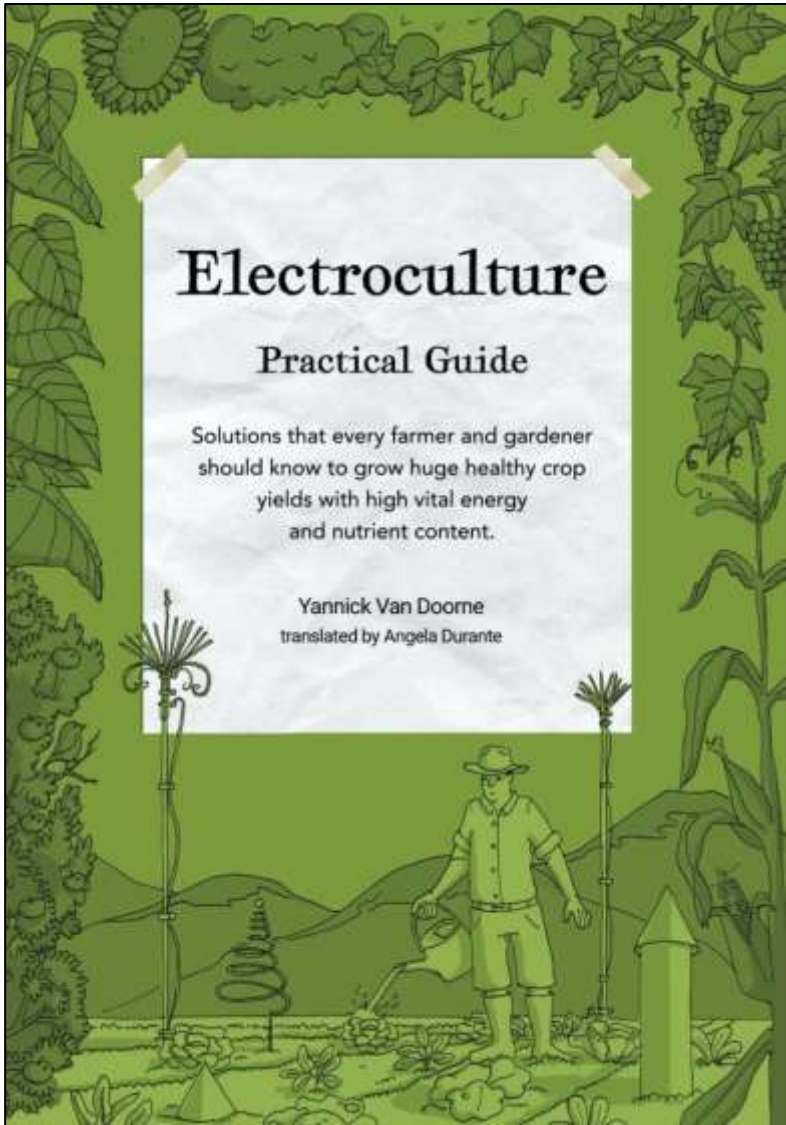
Paramagnetism

- Best soils are Volcanic
- Volcanic rock dust
  - Basalt
  - Granite
- Oxygen



Electroculture

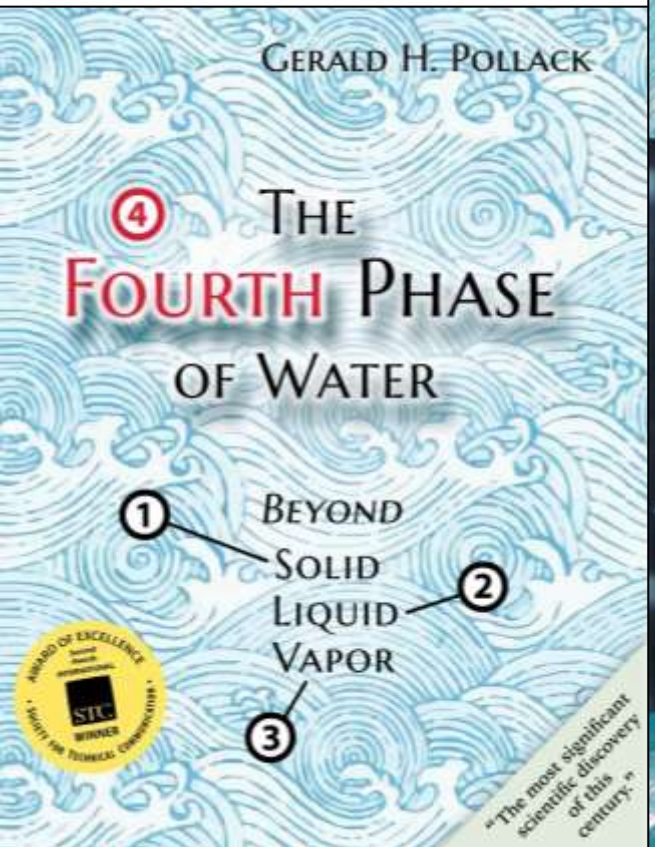
- Concentrate Cosmic & Earth Energies
- Antennas, Coils, Magnets, Pyramids

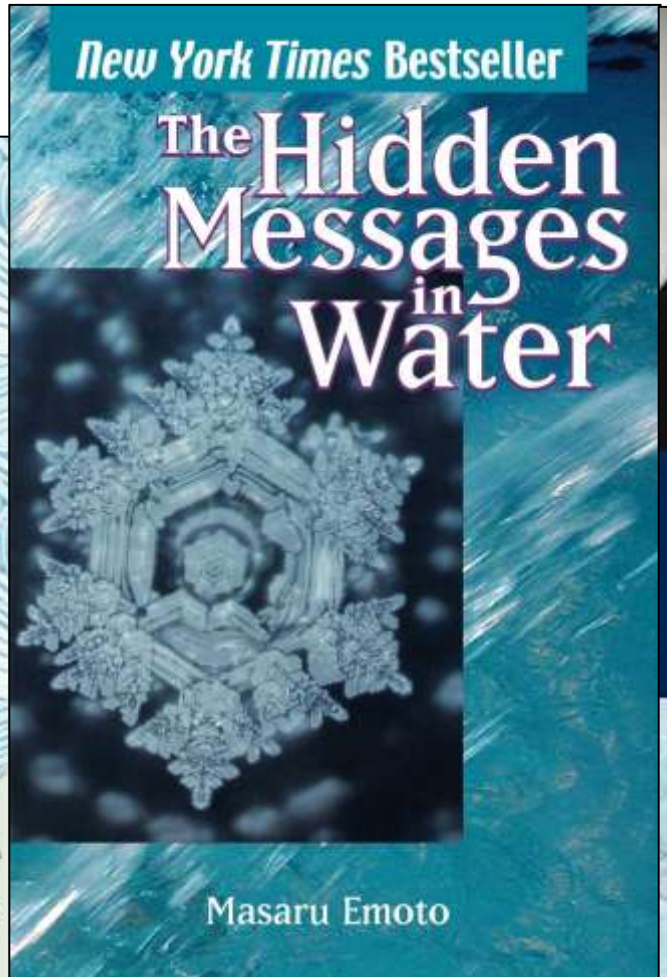


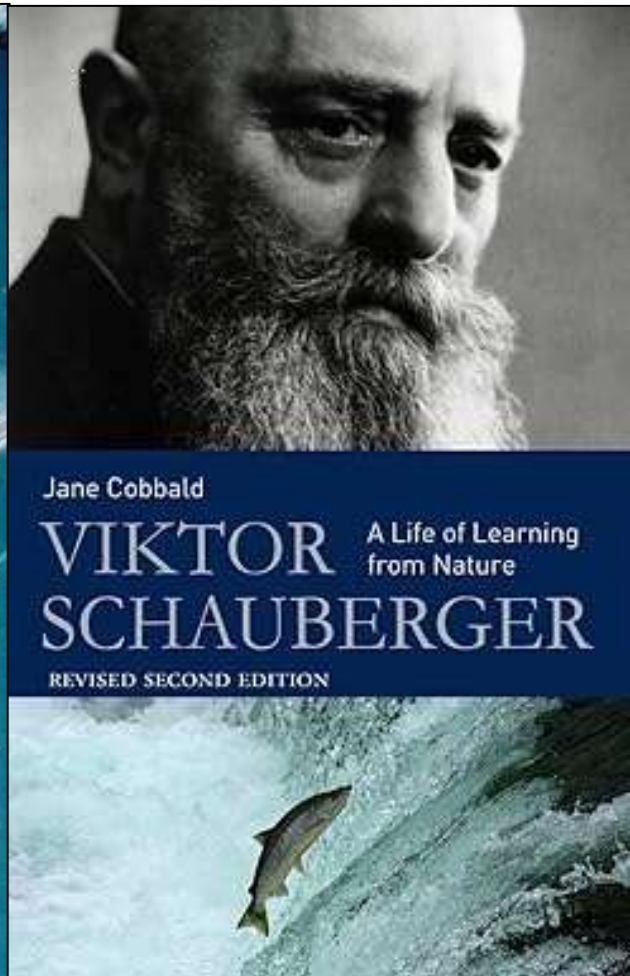
Homeopathy-1796

- Samual Hahnemann, German Physician
- Dilutions of medicines

“Magical” Water

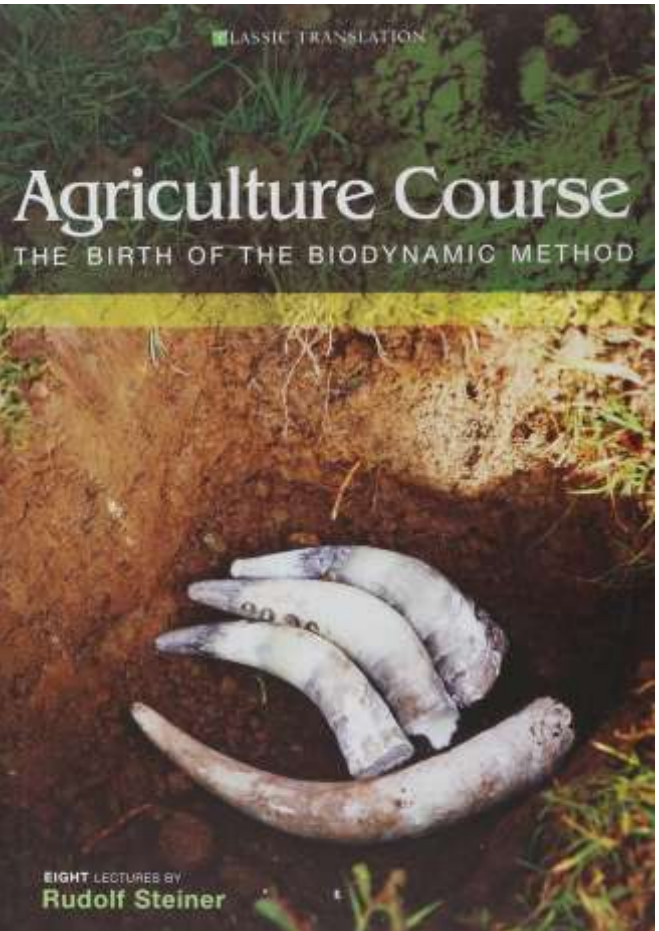


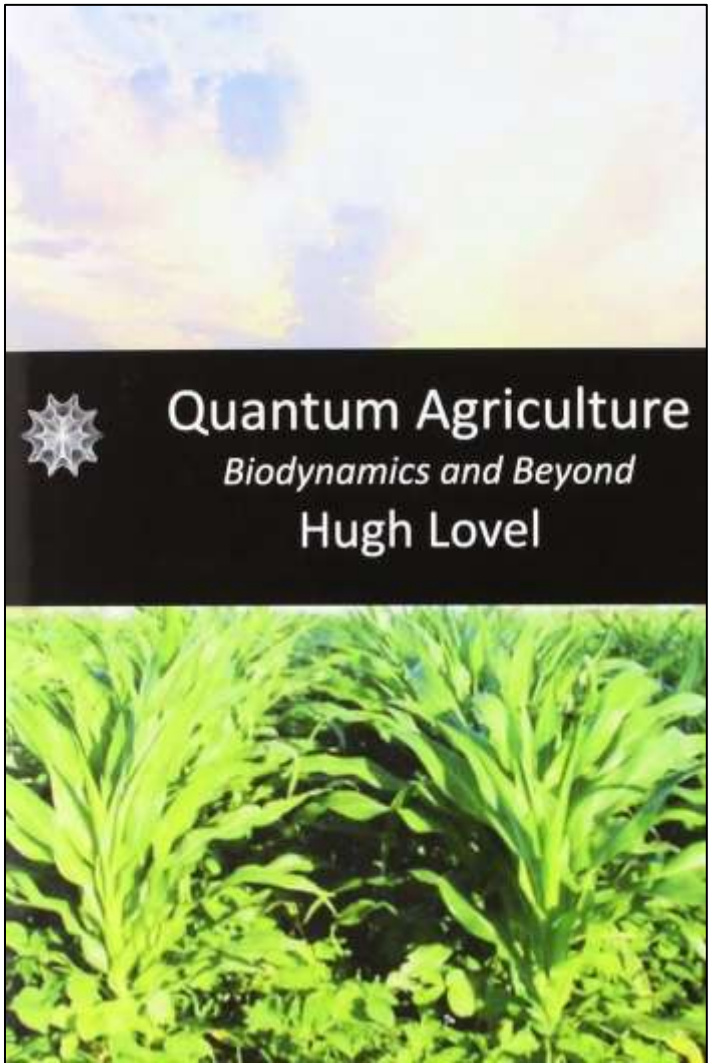




Biodynamic Farming

- Homeopathic treatments
  - BD 500-507





What Can Be In This Stuff??

Minerals?
Rock Dust?
Fungal Spores?
Energized Water?
Homeopathic Water?

BREAK TIME!

Part 3—Now What??

Objectives—Part 3

- Now What??
- Scientist & Microbe Farmer
- Real World Examples

Be Your Own Scientist!

- Science: The study of nature through observation and experimentation.

- Farmers were the original scientists "observing" every day.

- Become a SOIL SCIENTIST!

Become a Microbe Farmer!

- Microbiome Needs…
  - Air
  - Water
  - Food
  - Comfort (Shelter)

Bread Dough

- You've been a MICROBE FARMER!!

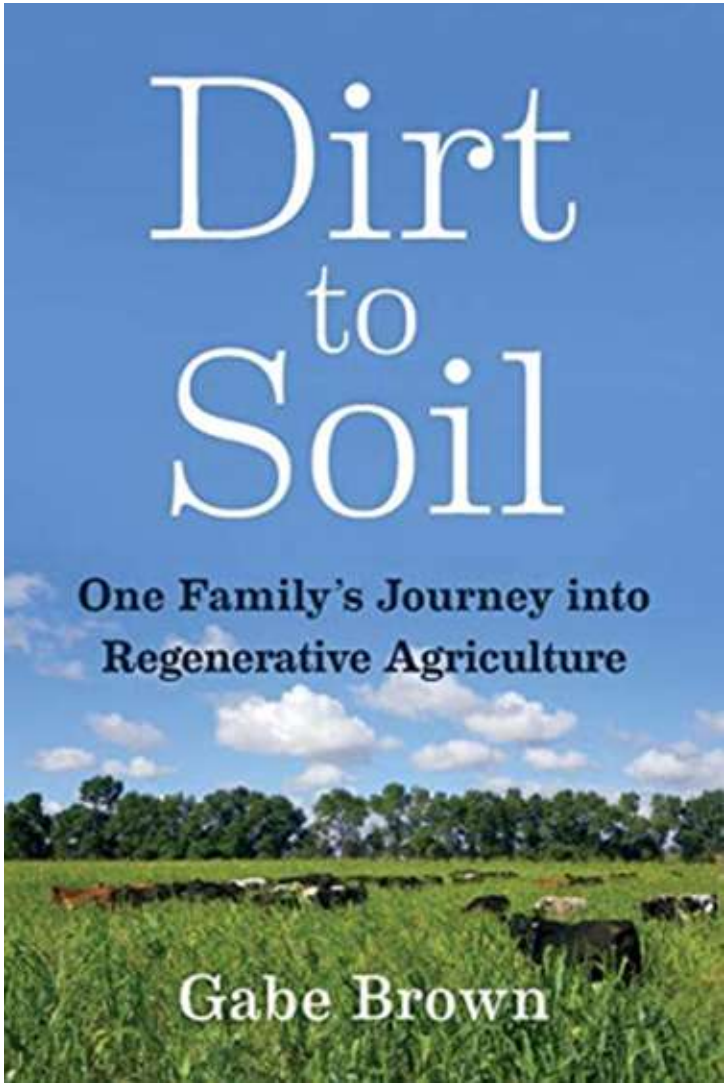
- Microbes +
  - Air
  - Water
  - Food (Sugar & Flour)
  - Comfort (Warm Place to rise)

What Not to Do!

Apply the Principles

- Farming & grazing principles:
  - Context
  - Limit Disturbance
  - Armor the Soil Surface
  - Build Diversity
  - Keep Living Roots in Soil
  - Integrate Animals

- Urban Landscaping Too!!



Utopia—Nonstop Party!!

- Aerobic, mineral rich, humus laced, high Cation Exchange Capacity (CEC) soil substrate
- Thriving, aerobic, symbiotic, diverse Soilfoodweb
- Dynamic earth, cosmic, and life force energy

- Like a trip to Nashville, every journey will be different.

Mehlich 3 Soil Test

Lab Number: 602069 **Sample Name:** TEST2 **Farm Name:**

Soil Results

pH		Phosphorus	Potassium	Calcium	Magnesium	Zinc	Iron	Manganese	Boron	Sodium
Soil pH	Buffer Value	P	K	Ca	Mg	Zn	Fe	Mn	B	Na
		Pounds per acre - Mehlich 1								
6.65		25 M	84 L	1842 S	140 S	2.3 S	17 S	20 S	0.5	12

Crop/plant Interpretation ranges on last sheet

L = Low, M= Medium, H=High, V= Very High, S = Sufficient

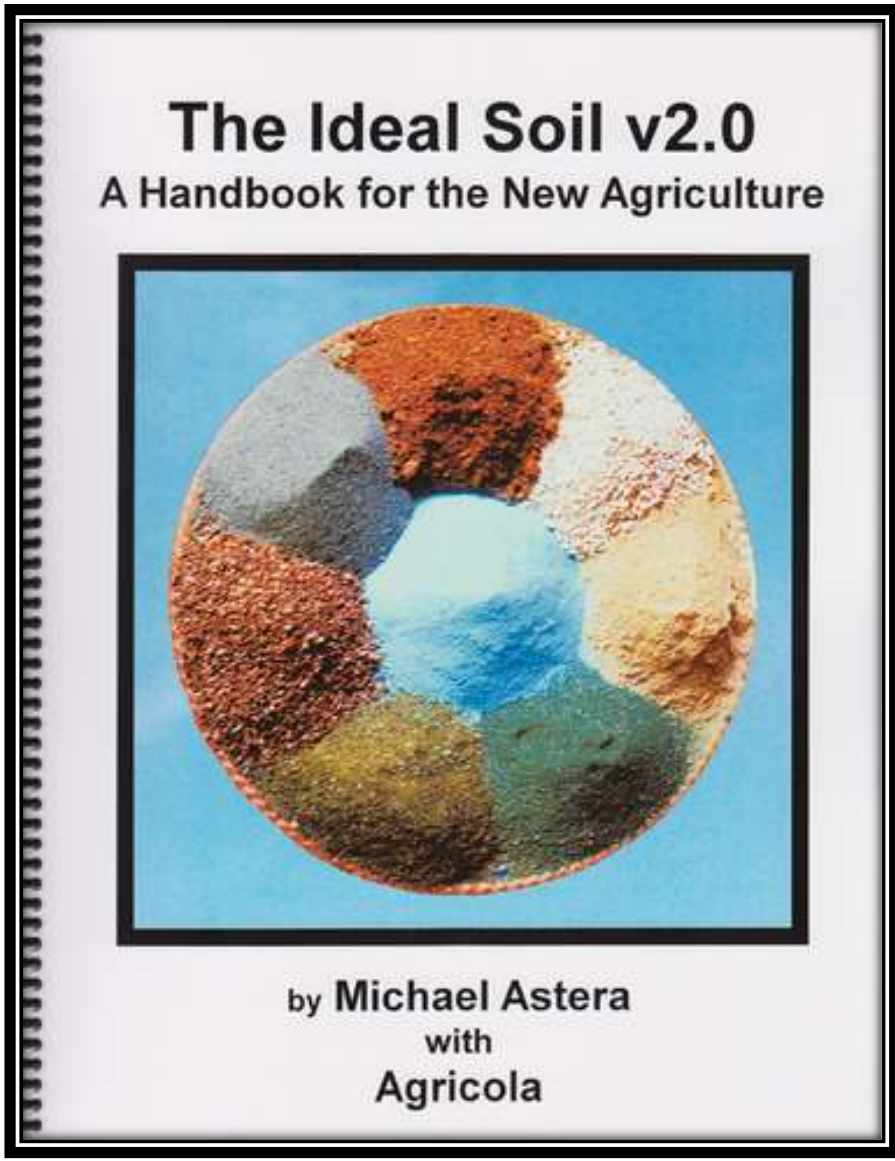
Additional tests, if they were requested											
Sulfur	Nitrogen			Carbon	C/N Ratio	Organic Matter	Soluble Salts	Particle Size Analysis - Hydrometer Method			
LBS/ACRE	NH4-N ppm	NO3-N ppm	Total N %	%	%	%	dS/m	% Sand	% Silt	% Clay	Soil Texture
						3.3	0.03	20	64	16	Silt Loam

Dr William Albrecht

<u>University of Missouri</u>

1920s-1960s

"…I could help more people through soil science because of the link to health than I could from becoming a medical doctor."



Chemistry--Minerals

- Dr Carey Reams (1903-1985)
  - Calcium: 2000 (lbs/acre)
  - Phosphorus: 400
  - Potassium: 200
  - Sulphur: 200
  - Nitrates: 300
  - Ammonium: 40
  - Iron: 40

Sources of Microbes (Yeast)

- Livestock & Manure
- Earth Worms
- Static Composting (Leaves, grass clippings)
- Vermicomposting (Red Wiggler Worms)
- Thermophilic Composting
- Dr David Johnson/Su Bioreactor
- Korean Natural Farming
- Raw Milk
- Commercial Products

Extract Demo

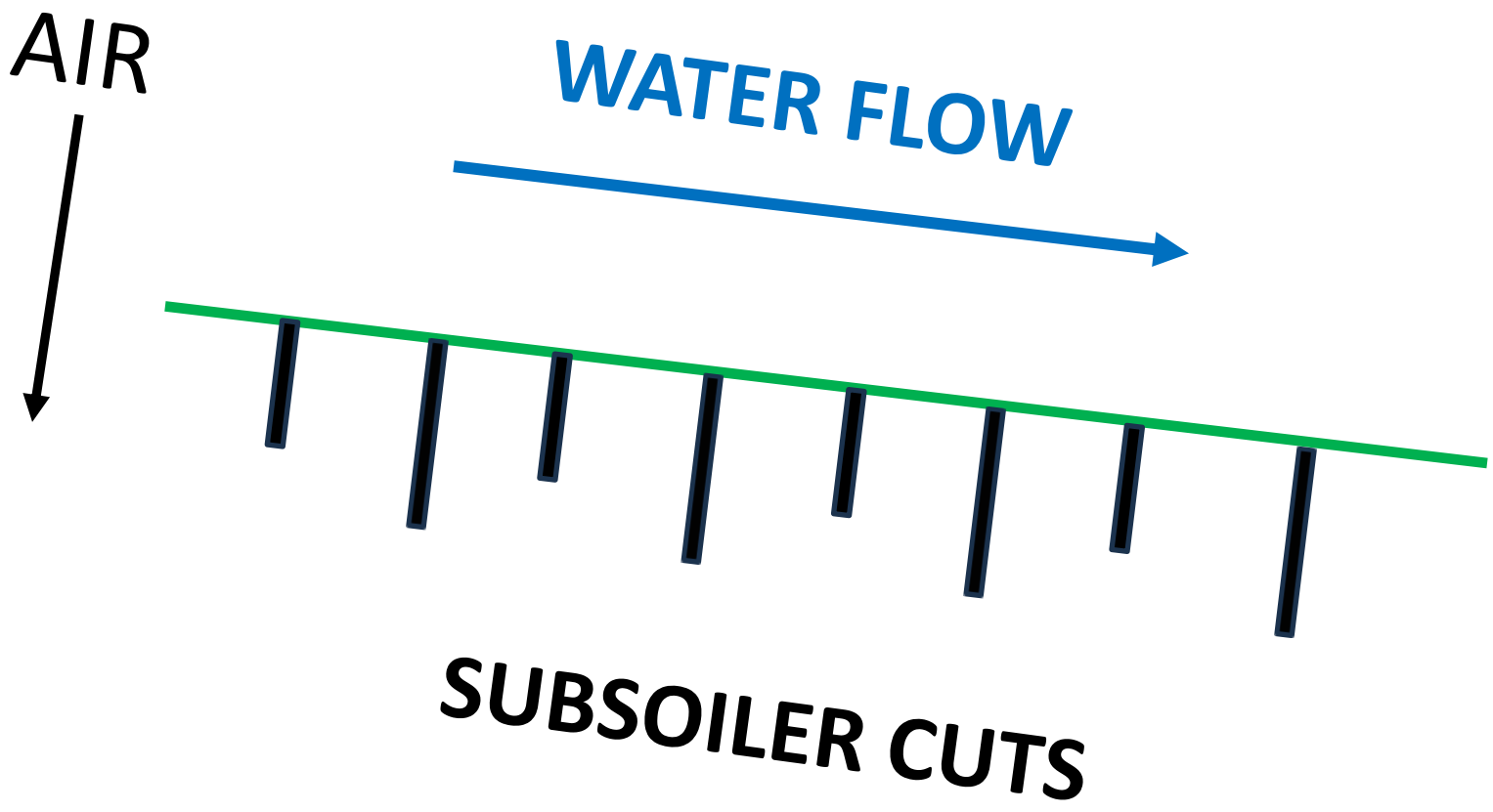
HIWASSEE
PRODUCTS

$2,500-$16,500

Examples

- From Theory to Real World

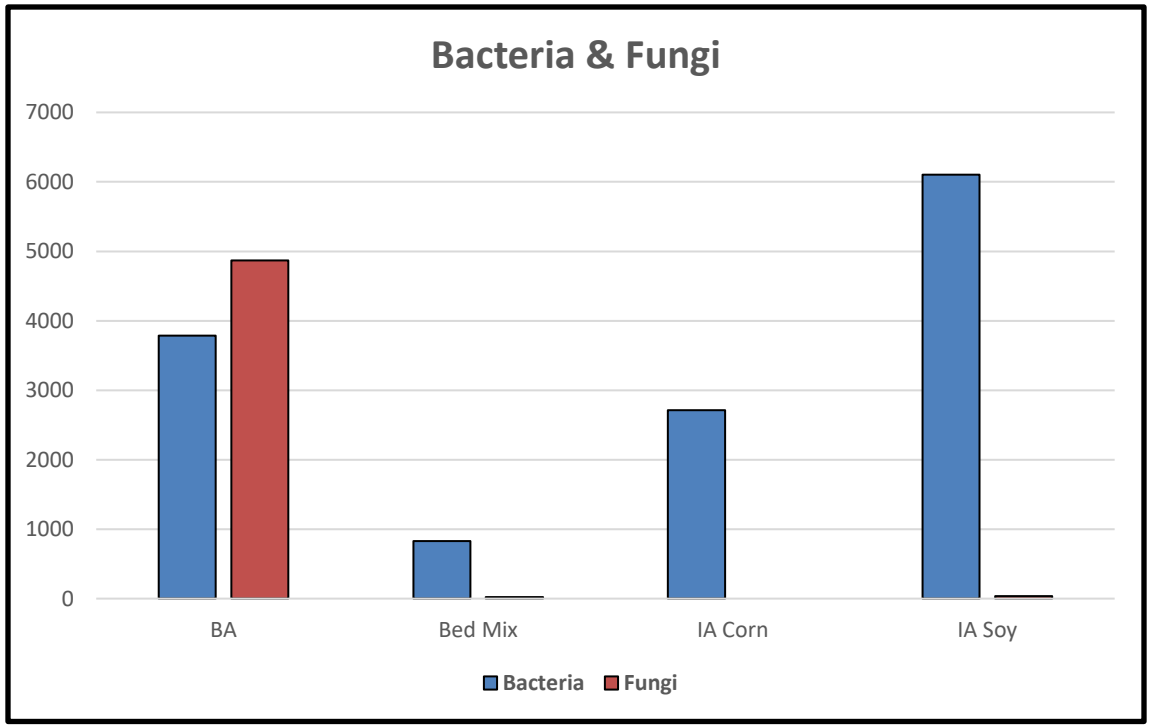
- Teejet Lawn Spray Gun
  - 1.5 & 3.0 gpm
  - Seaflo 3.0 gpm diaphragm pump (12V DC)

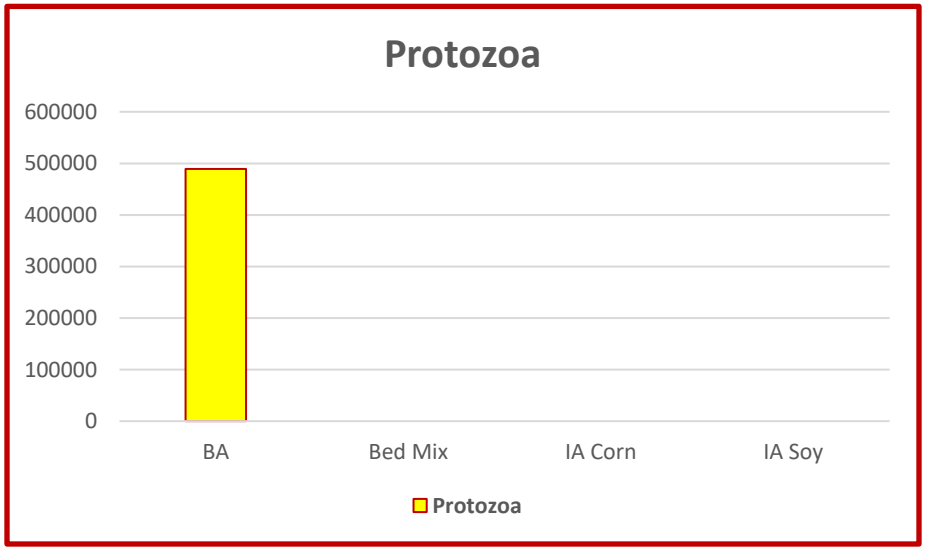

AIR
WATER FLOW
SUBSOILER CUTS

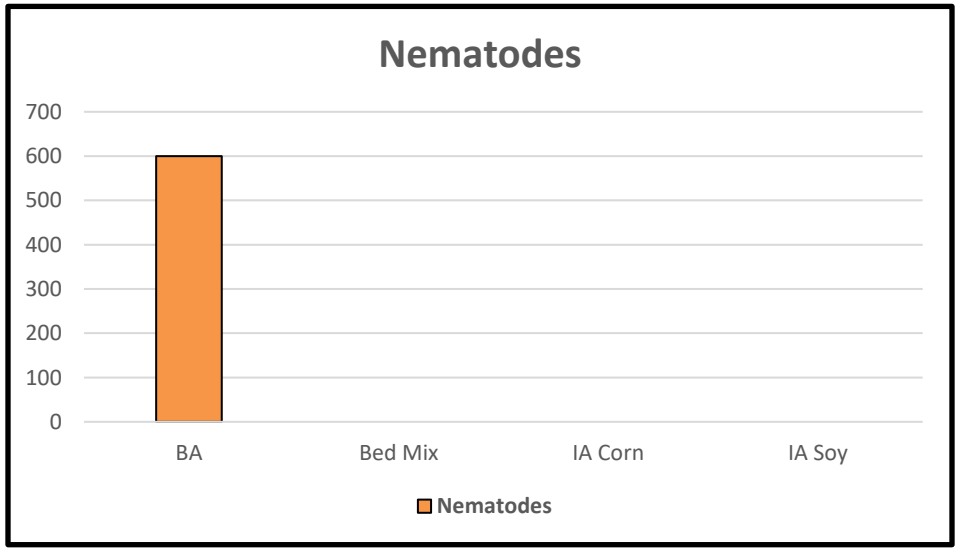
Subsoiler

Product Weight: 635 lb.

Garden Repair (2021)


Bacteria & Fungi
7000
6000
5000
4000
3000
2000
1000
0
BA
Bed Mix
IA Corn
IA Soy
Bacteria
Fungi

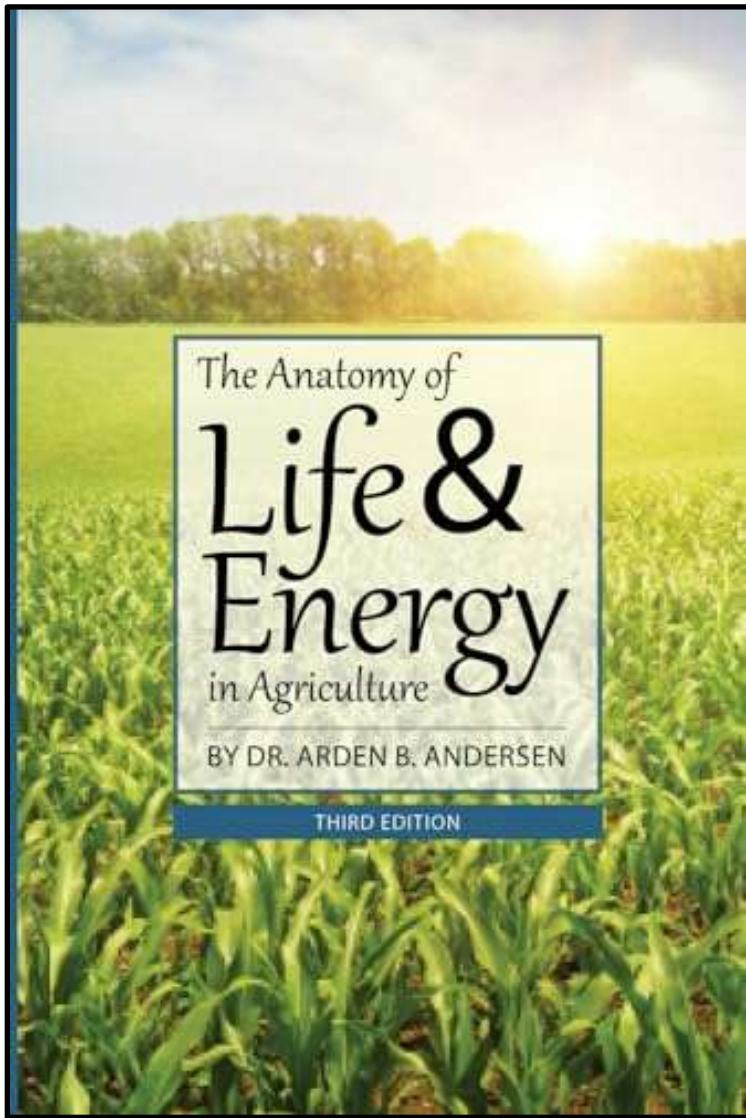

Protozoa
600000
500000
400000
300000
200000
100000
0
BA
Bed Mix
IA Corn
IA Soy
Protozoa


Nematodes
700
600
500
400
300
200
100
0
BA
Bed Mix
IA Corn
IA Soy
Nematodes

Garden Repair (Fall 2021)

Dr Arden Andersen

- (All per 1000 $ft^{2)}$
- Soft Rock Phosphate 12 lbs
- High-calcium lime 23-46 lbs
- Ammonium sulphate 2.3 lbs
- Compost 12-184 lbs

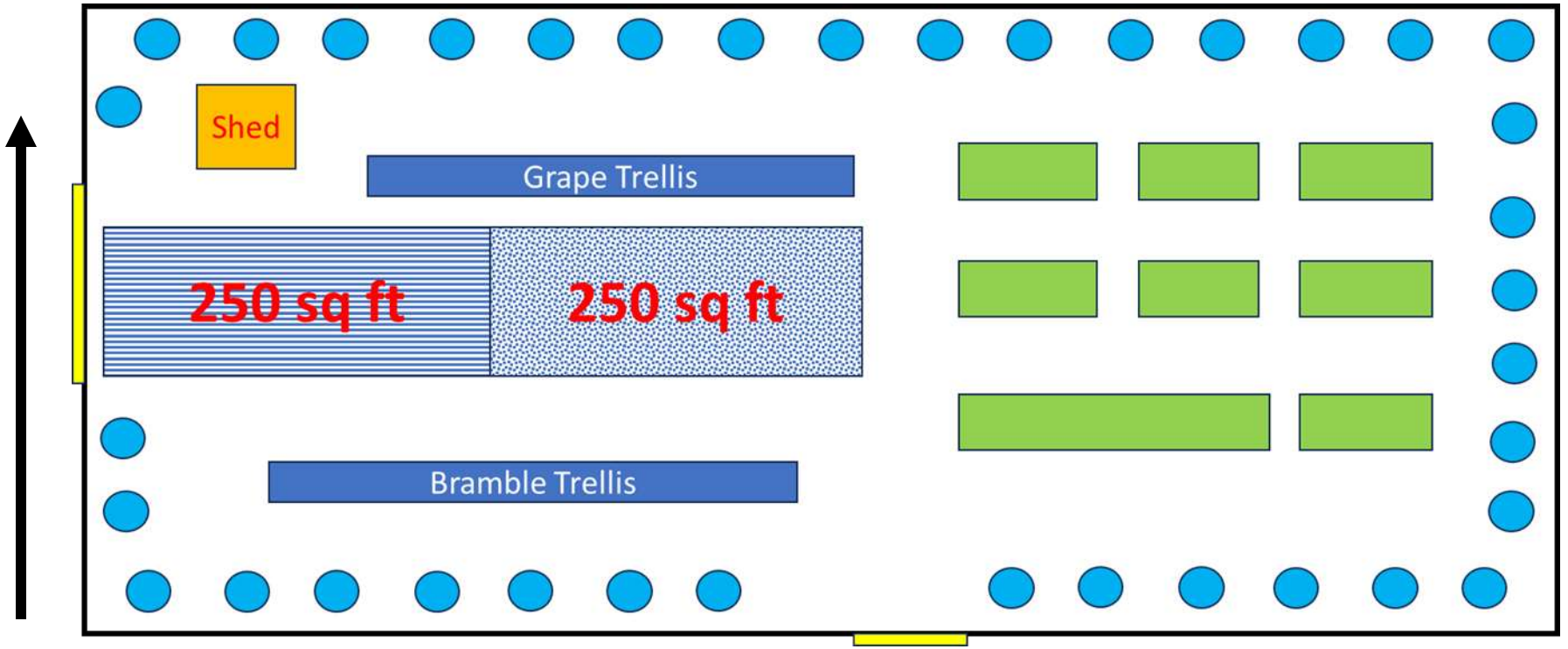


Foliar Sprays--KNF

Garden Example
(21 Apr 25)

Garden Example

- Context: Mowed pasture, compacted, no chemicals or fertilizers in recent history
  - Nutrient Dense Fruits & Veggies
  - Healthy Living Soil, Aerated, Mineral Rich



What's in Your Toolbox?

- $ or $$$$?
- Lots of time or no time?
- Wood chipper or tree service delivery?
- Pitch fork or tractor?
- Hand seeder or no-till drill?
- Livestock?

TIMELINE (5 Jun 24)

- 8” wood chips; Apr 21
- 12” moldy hay; Nov 22
- 12” moldy hay; Mar 23
- Corn & Other; Apr 23
  - Poor results

- Covers Rye/Vetch; Dec 23
- Egg Mobile; Feb 24
- 2x Tilled Bermuda; Apr 24
- Soil Drench w/2 lbs; Apr 24
  - Redmond 9 oz
  - Dextrose 10 oz
- Planted; Apr 24
  - Sweet Corn
  - Dent Corn
  - Milpa (GreenCover)

Caution for Materials

- Gather “organic” foods
  - If it’s lived once, it can live again!
- Bacteria & Fungi take it from there!

- CAUTION—Persistent Herbicides
  - NC State “Herbicide Carryover in Hay, Manure, Compost, & Grass Clippings”

Persistent Herbicides

- Corteva's Grazon® (Aminopyralid)
  - Broadleaf weed control in pasture

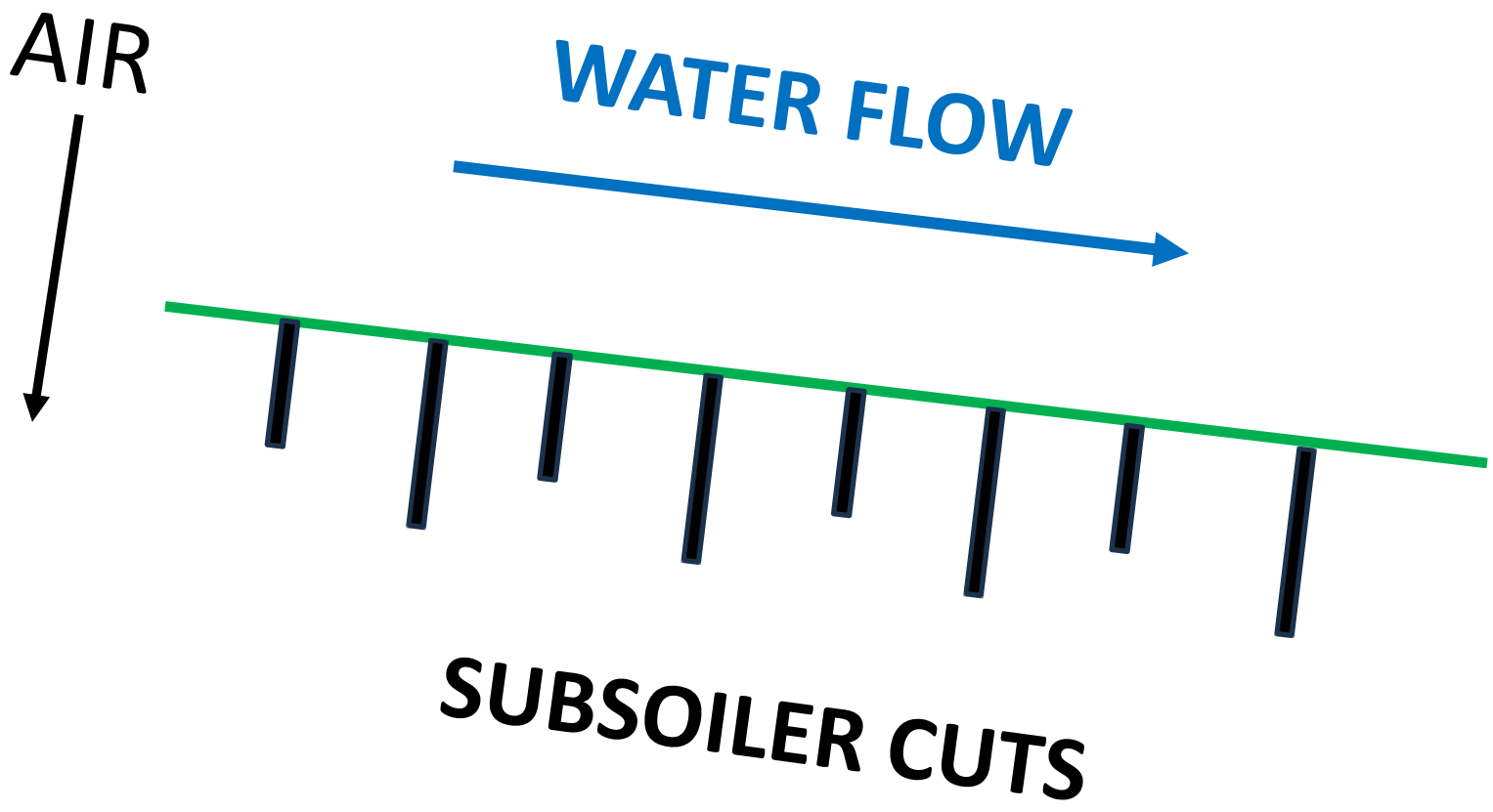
TIMELINE (24 Jun 24)

- Growing well
- Corn Earworms

TIMELINE (11 Sep 24)

- Harvest Dent Corn
- Mowed Residues

Penetrometer--Compaction

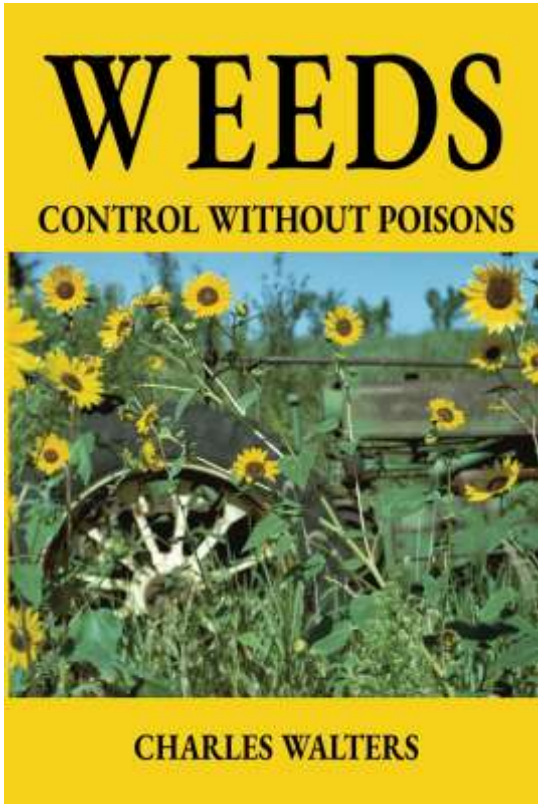

AIR
WATER FLOW
SUBSOILER CUTS

TIMELINE (16 Oct 24)

- Compaction
  - 150 psi—3.8”
  - 300 psi—4.5”
- Subsoiler & Biology
- Covers Rye/Wheat
- Soil Drench (3 lbs/12 gal)
- 2.5 lbs Calusolv East
  - (10 lbs/1000 ft^2)
- 1 lb Redmond West
  - (4 lbs/1000 ft^2)

CaluSolv (www.calusolv.com)

- Stan Pace, farmer, County Extension Agent
- 2005: “Weeds, Control Without Poisons.”
- Weeds there to fix Ca deficiencies
- Compaction Ca:Mg (< 5:1)
- Brett Morehouse & Chemway



Hand Seeders—Seed or Minerals

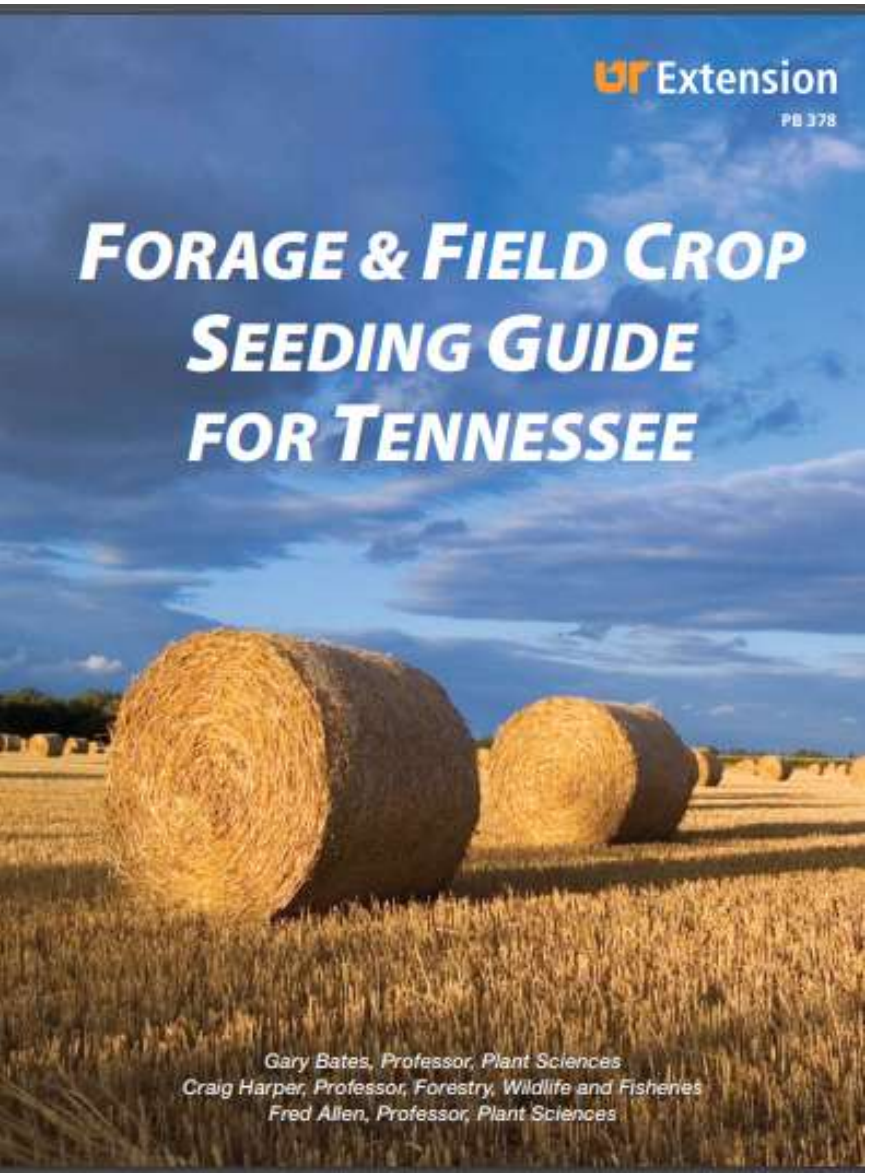
Watering Can—Biology or Minerals

Hand Sprayer Foliars

TIMELINE (24 Dec 24)

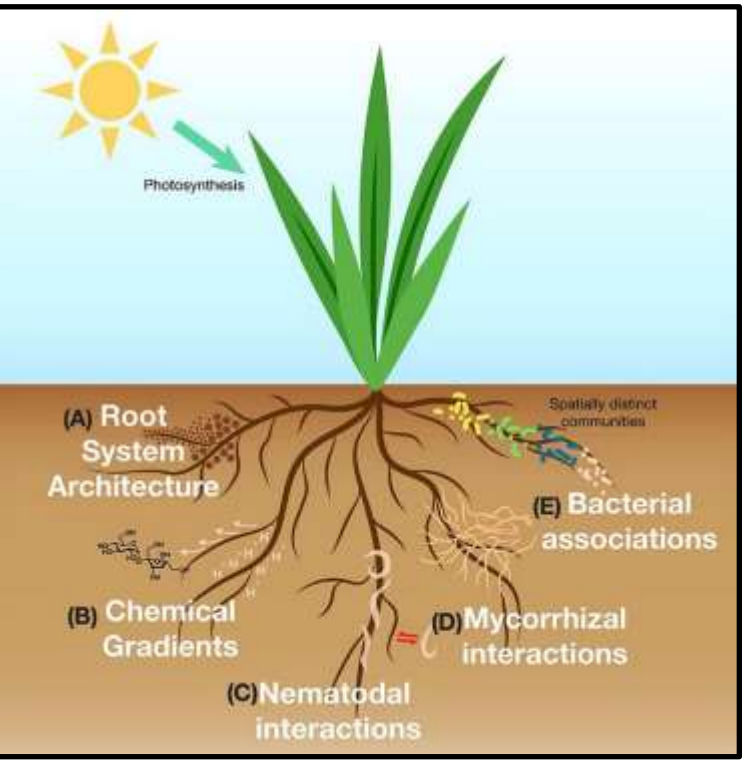
- Cover Plants (Rye & Wheat)
- Collecting Solar Energy
- Sugar to biology all winter

Cover Plant Diversity



Dr Ream's 80/20 Rule

- 80% of plant mass comes from the air
- 20% from the soil



Organic Matter:
100 lbs above & 100 lbs below
- 160 lbs air & 40 lbs soil

Photo Source: Soil Science Society of America

My Favorites

- Cool Season
  - Hairy Vetch, Austrian Winter Peas
  - Red & White Clover (4 & 2 lbs/acre)
  - Cereal Rye & Wheat
  - Orchardgrass

- Warm Season
  - Sorghum/Sudan
  - Buckwheat

- Green Cover (Greencover.com)

Green Cover (Greencover.com)

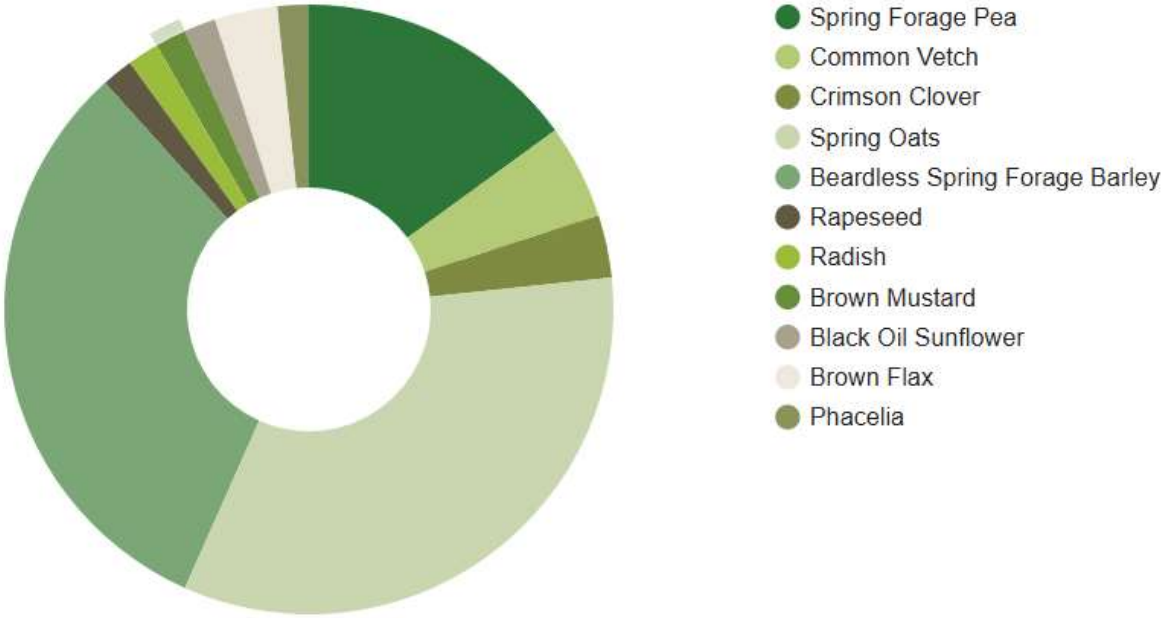
GREENCOVER

What are you looking for?

Seed | Food Plots | Mixes | Milpa | Inoculants | Resources | SmartMix Calculator | Merch

*OMRI Certificates: OMRI Certificate for Elevate'd Fungi; OMRI Certificate for RhizoBac X-Tend

What's in the Mix



TIMELINE (10 Feb 25)

- Integrate Livestock
- Egg Mobile Grazing

TIMELINE (26 Feb 25)

- Tarped Area
- Terminate Covers

TIMELINE (8 Apr 25)

- Uncovered
- Compaction; Oct 24
  - 150 psi—3.8”
  - 300 psi—4.5”

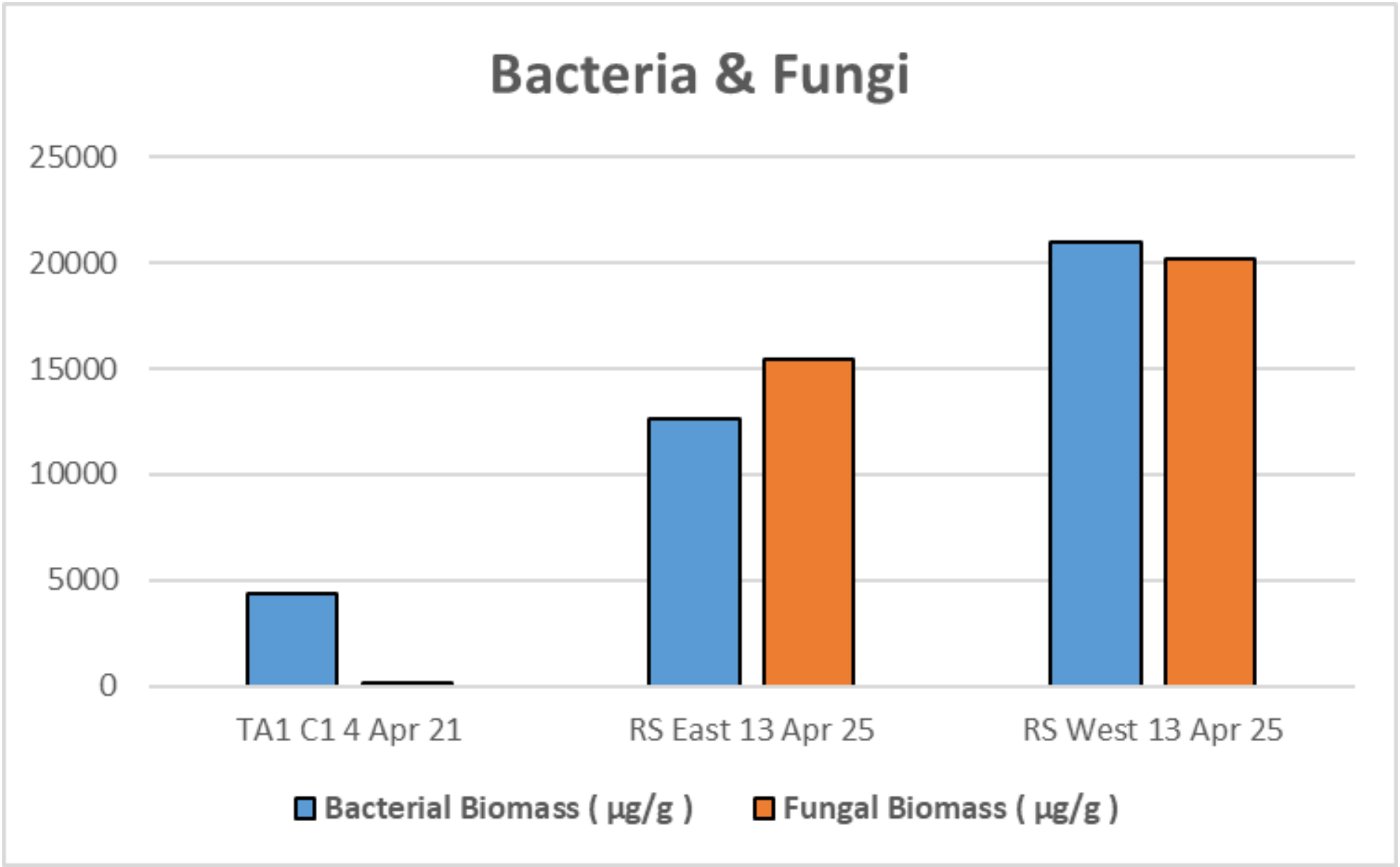
- Compaction (Apr 25)
  - 200 psi—8.7”
  - 300 psi—13.9”

- Soil Samples; 13 Apr 25

TIMELINE (8 Apr 25)

- Shovel Test

Soil Samples (Apr 13, 2025)



TIMELINE (14 Apr 25)

- Straw
- 2.5 lbs Calusolv East
  - (10 lbs/1000 ft^2)
- 1 lb Redmond West
  - (4 lbs/1000 ft^2)

20 Apr 25

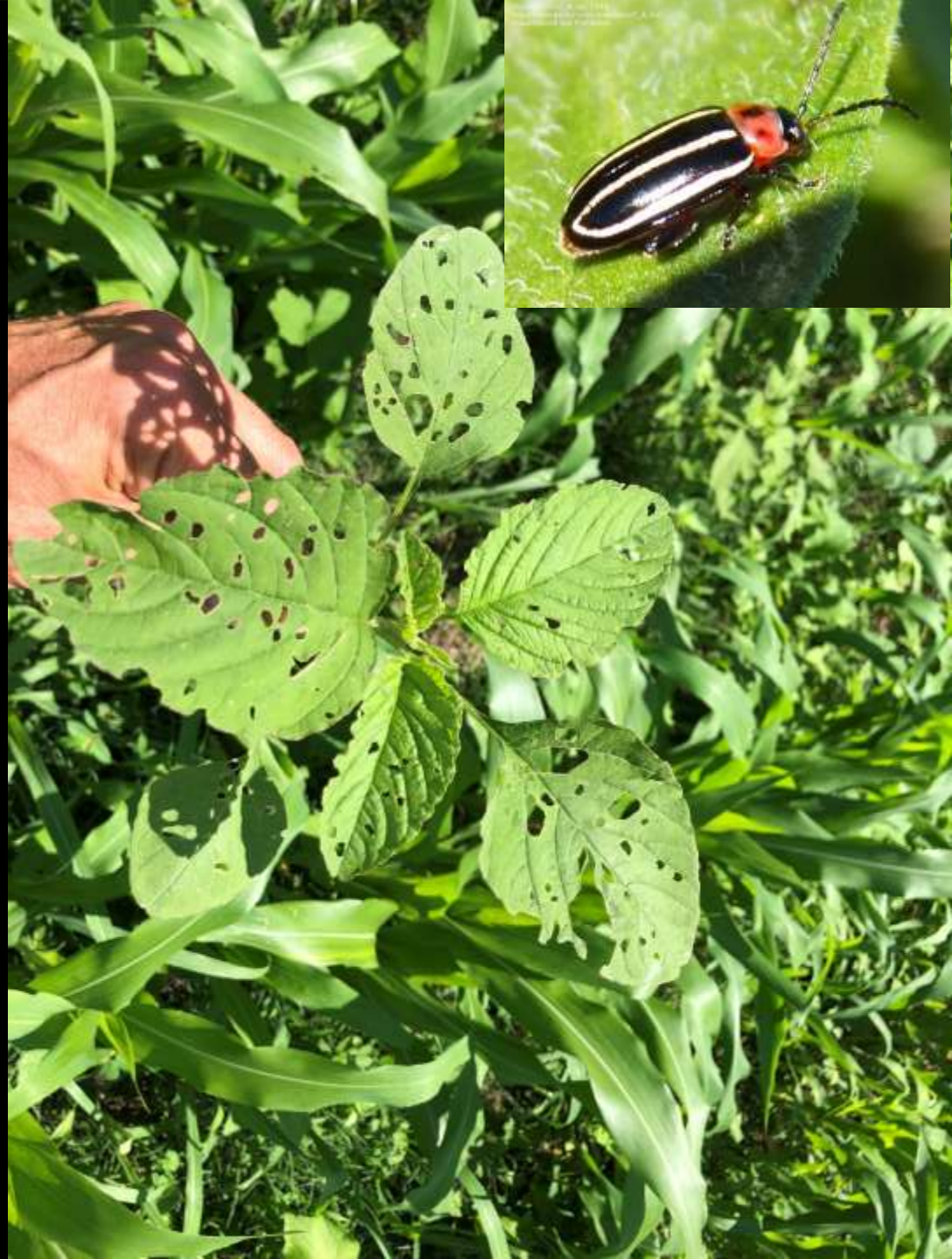
TIMELINE (20 Apr)

- Raked Straw Back
- Tilled 1x
- Planted Variety
  - Milpa (Green Cover)
  - Sweet Corn
  - Melons
  - Squash
- Amendments (Wet)
  - Extract (1.5 lbs)
  - Molasses (2 TBSP)
  - Agribio Ca 7% (2 TBSP)
  - Borax--9% Boron (4 g)

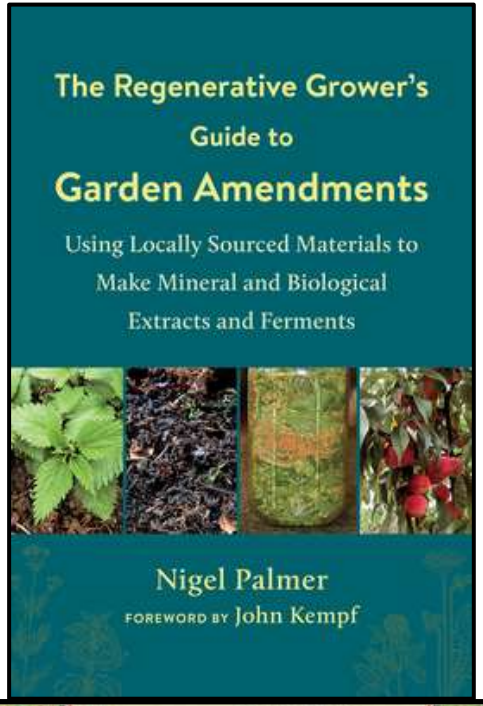
TIMELINE (20 Apr)

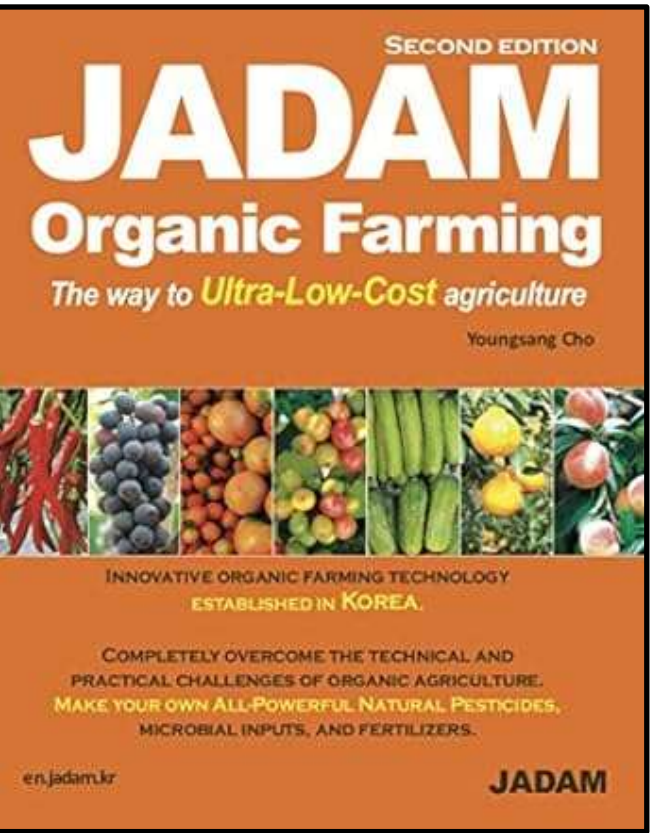
- Amendments (Dry)
  - Sand (1 Qt)
  - Biochar (1/2 cup)
  - IMO-4 (1/2 cup)
  - Myco Bliss (2 TBSP)
  - Basalt Dust (2 TBSP)

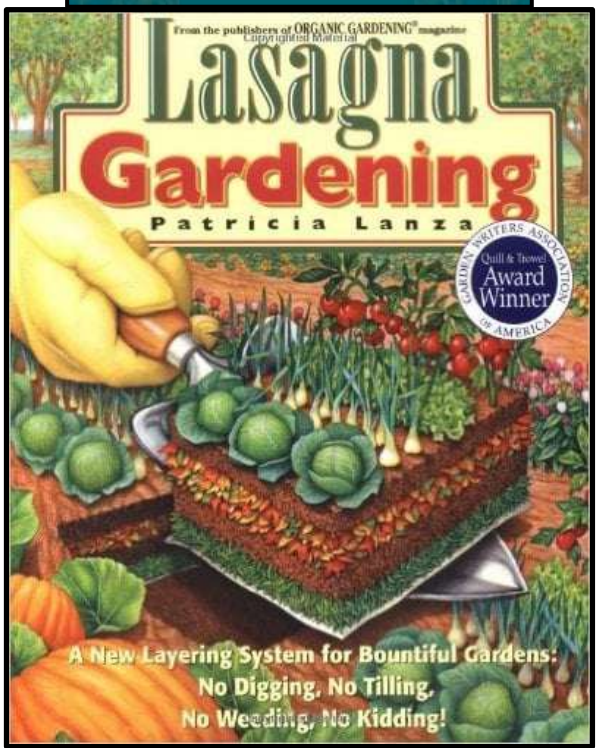
- Rain 0.7” (21 Apr 25)!!

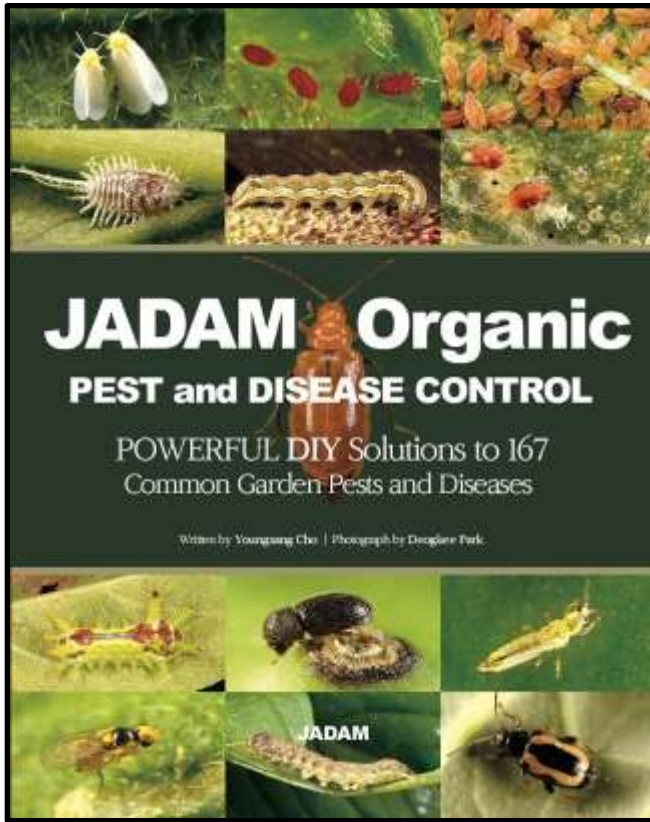


22 Nov 25 & 23 Jan 26


The Regenerative Grower's
Guide to
Garden Amendments
Using Locally Sourced Materials to
Make Mineral and Biological
Extracts and Ferments
Nigel Palmer
FOREWORD BY John Kempf

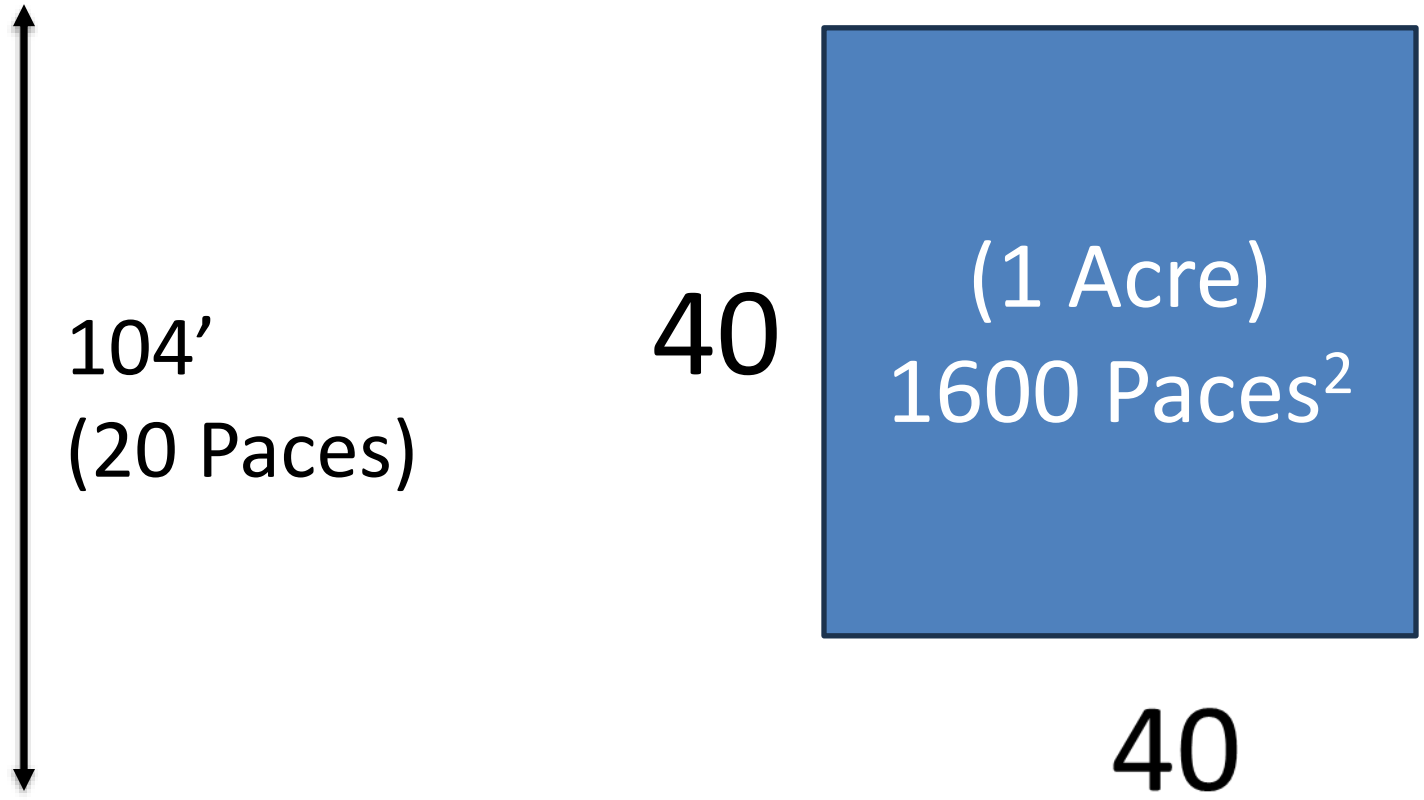

SECOND EDITION
JADAM
Organic Farming
The way to Ultra-Low-Cost agriculture
Youngsang Cho
INNOVATIVE ORGANIC FARMING TECHNOLOGY
ESTABLISHED IN KOREA.
COMPLETELY OVERCOME THE TECHNICAL AND
PRACTICAL CHALLENGES OF ORGANIC AGRICULTURE.
MAKE YOUR OWN ALL-POWERFUL NATURAL PESTICIDES,
MICROBIAL INPUTS, AND FERTILIZERS.
en.jadam.kr
JADAM


From the publishers of ORGANIC GARDENING® magazine
Lasagna
Gardening
Patricia Lanza
Quill & Trowel
Award
Winner
A New Layering System for Bountiful Gardens:
No Digging, No Tilling,
No Weeding, No Kidding!


JADAM Organic
PEST and DISEASE CONTROL
POWERFUL DIY Solutions to 167
Common Garden Pests and Diseases
Written by Youngsang Cho | Photograph by Douglas Park
JADAM

Pasture Example

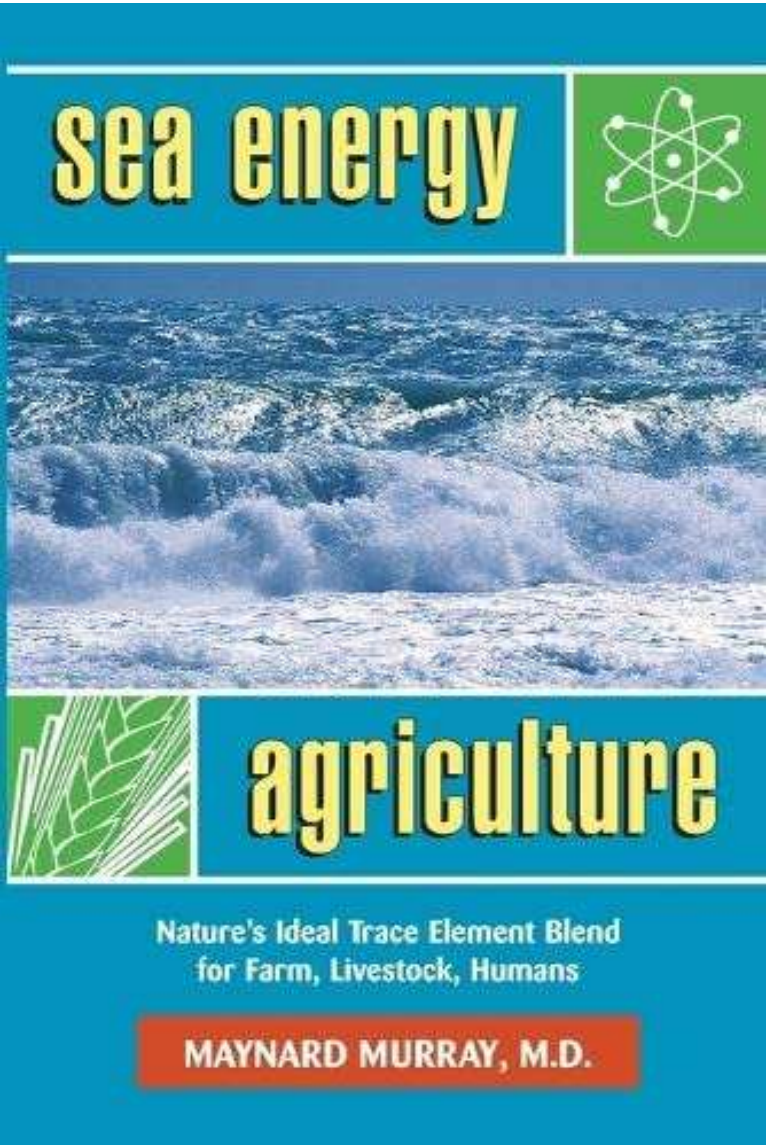
Pace Count



Context (2015-2020)

- ≈ 1/3 acre pasture terrace
  - Rotationally grazed
  - Planted some covers
  - Biology treatments
  - No recent chemicals
  - Compacted
- Goals
  - Nutrient Dense Forage for Cattle
  - Healthy Living Soil
  - Aerated
  - Mineral Rich

Sea Water Minerals

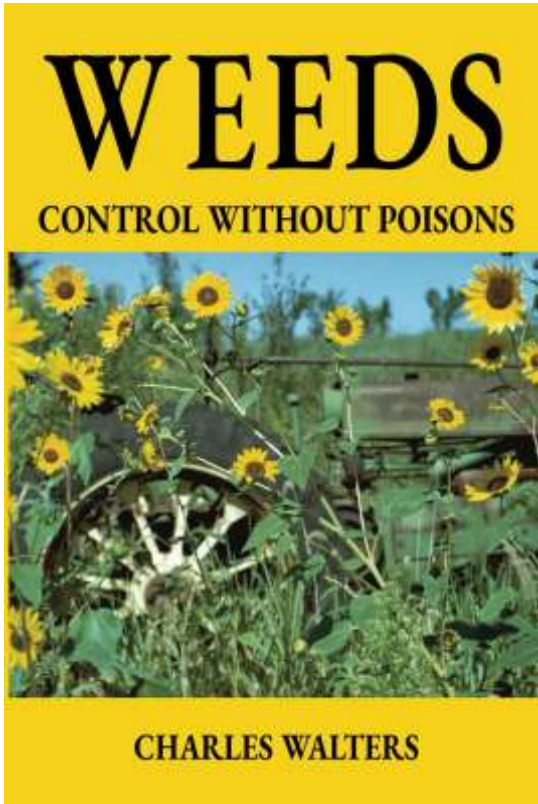


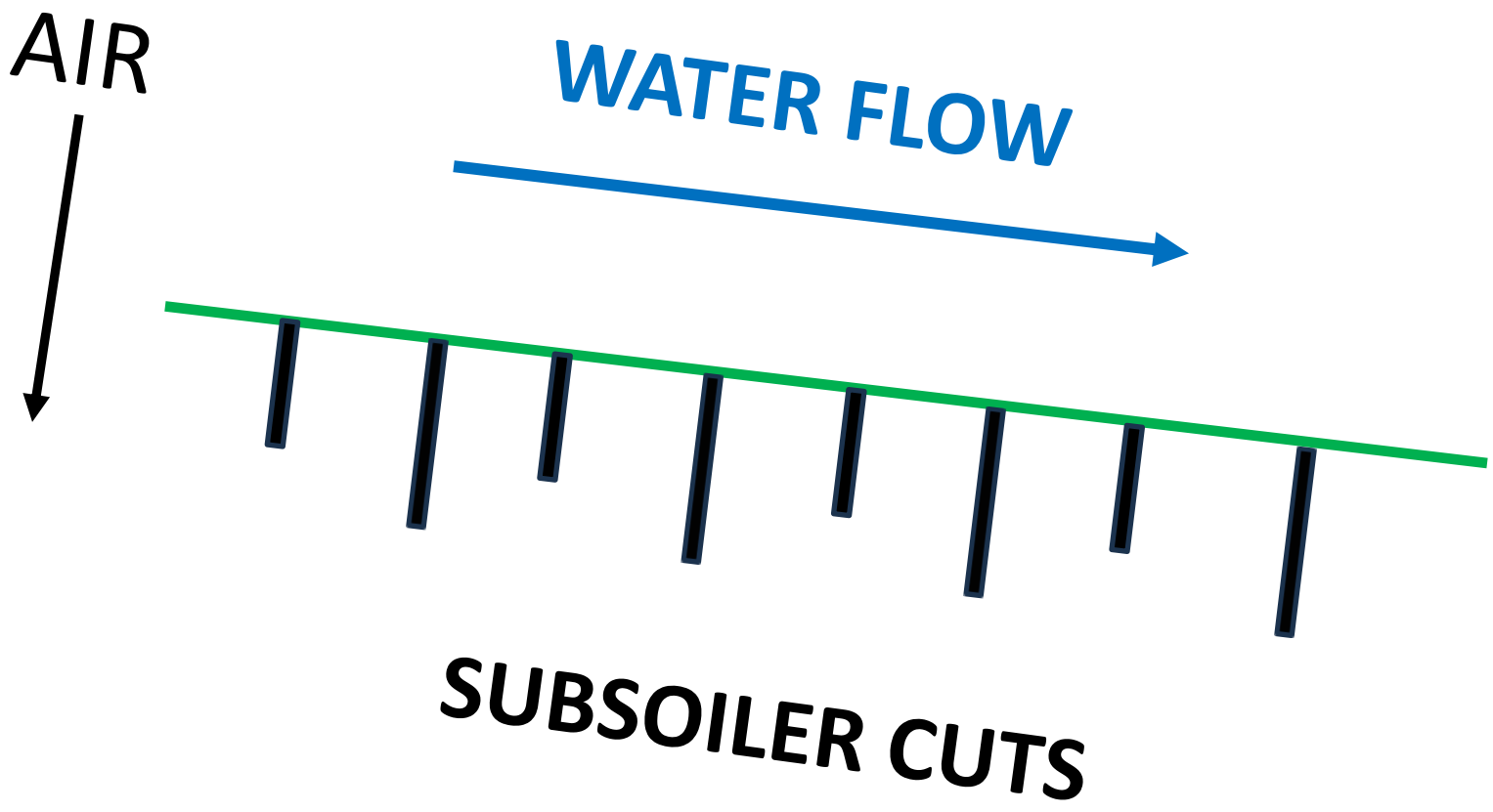
- Redmond or Sea 90
  - 200-2200 lbs/acre

- HighBrixGardens.com
  - 43 lbs/acre
  - 43 oz/acre (water)

CaluSolv (www.calusolv.com)

- Stan Pace, farmer, County Extension Agent
- 2005: “Weeds, Control Without Poisons.”
- Weeds there to fix Ca deficiencies
- Compaction Ca:Mg (< 5:1)
- Brett Morehouse & Chemway

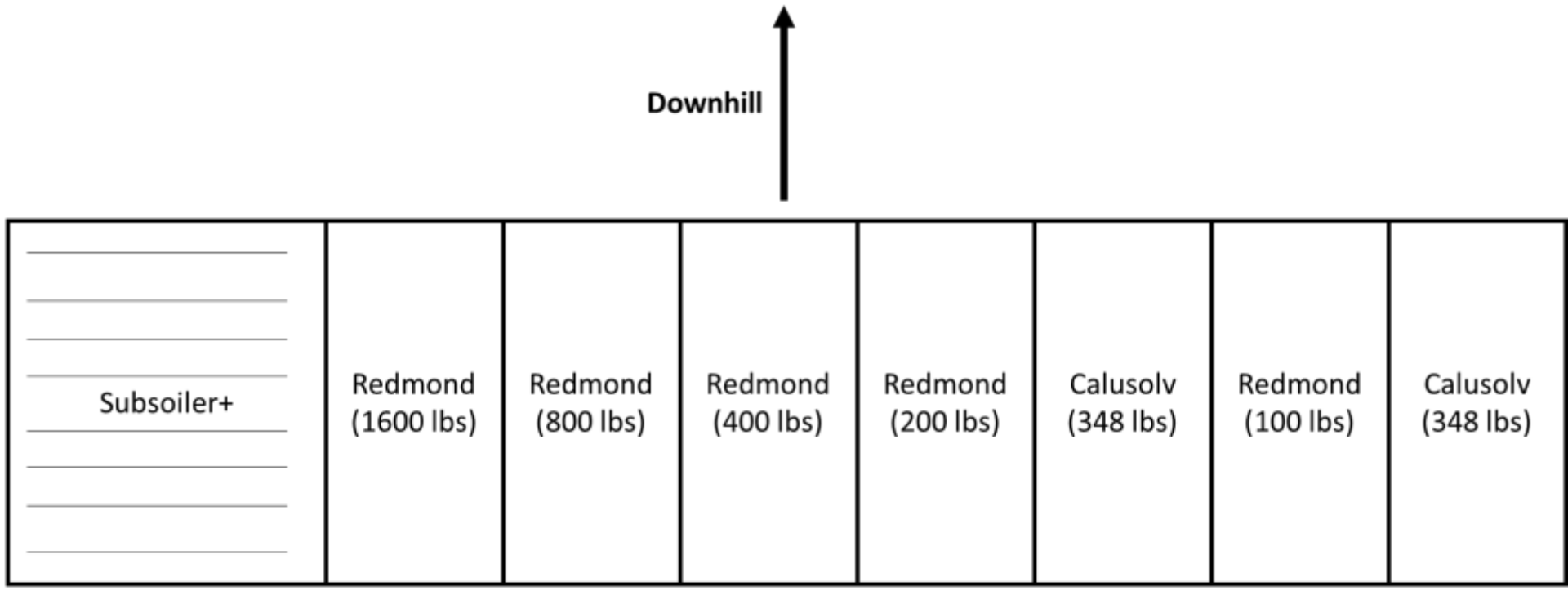



AIR
WATER FLOW
SUBSOILER CUTS

Hand Seeders


GREENSCAPE 600
CONSERVATION SEEDER

Pasture Tests (8 Plots)



Small plots 1000 sq ft
Subsoiler plot 5500 sq ft
Acre = 43560 sq ft

Timeline

- TT1-TT7
- 15-21 Oct 24—Bush hogged
- 15-21 Oct 24—Applied Redmond & Calusolv
- 22 Oct 24—Planted Cereal Rye & Wheat (3 lbs) w/seed coat
- 28 Oct 24—Top cover with Greenscape Planter w/seed coat

- TT8 (5500 sq ft)
- 2 Nov 24—Subsoil with Extract (2 lbs/50 gal)
- 3-5 Nov: Plant Rye/Wheat—w/seed coat
- 5 Nov: Soil Drench (2 lbs/60 gal)
- 11 Nov: Sprayed Extract (2 lbs/60 gal) + Redmond (2.75 lbs); Dextrose (2.75 lbs); Apple Cider Vinegar (1.4 cups)

Timeline (Cont)

- TT1-TT7 & ¼ of TT8
- 20 Mar 25—Grazed with 10 cattle

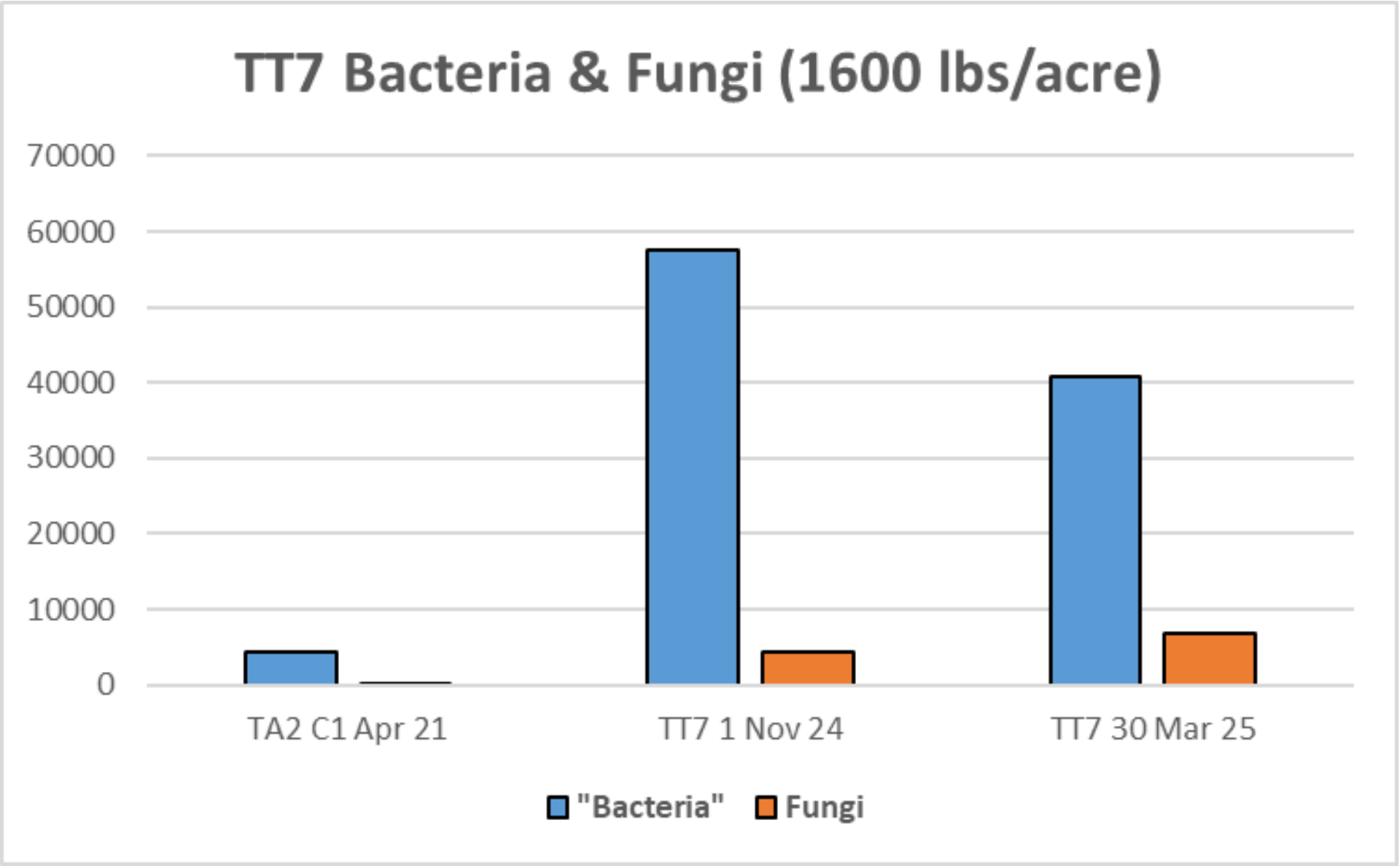
- 22 Mar 25—Applied Calusolv on TT1/TT3
- 28 Mar 25—Grazed rest of TT8 with 10 cattle

- 23 Apr 25—Grazed all with 13 head cattle
- 30 Apr 25—Planted 8 lbs Warm Season Grazing Mix (Green Cover)

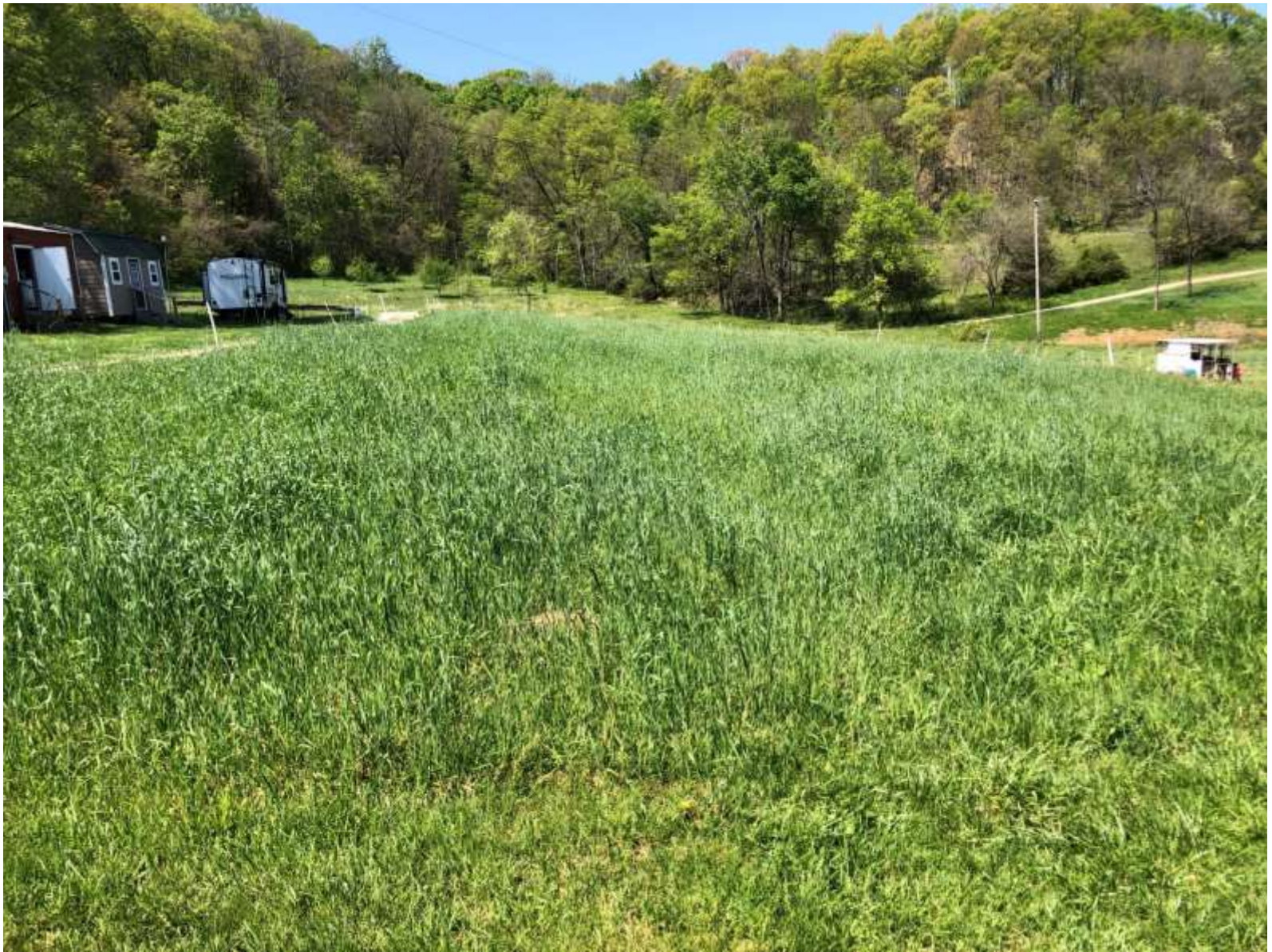
TIMELINE (8 Apr)

- Shovel Test

Soil Samples (Apr 13, 2025)



13 Apr 25



23 Apr 25

Brix Results

DATE	TT8	TT7	TT6	TT5	TT4	TT3	TT2	TT1
	Misc	Redmond 1600	Redmond 800	Redmond 400	Redmond 200	Calusolv 348	Redmond 100	Calusolv 348
19-Mar-25	11.8	12.5	11.2	10.6	11.8	14.3	12.3	15.5
19-Apr-25	11.0	8.8	7.5	7.8	11.0	11.3	10.5	9.5
AVG	**11.4**	**10.6**	**9.3**	**9.2**	**11.4**	**12.8**	**11.4**	**12.5**

19-Apr-25	
Rye Gone to Seed Leaf	8.25
Rye Gone to Seed Stem	4.5

What Do They Think?

Cattle Preference (23 Apr 25)

Cattle Preference (20 Mar 25)

DATE	TIME	TT8	TT7	TT6	TT5	TT4	TT3	TT2	TT1
		Misc	1600	800	400	200	Calusolv	100	Calusolv
20-Mar-25	0:10	1	1		1	2	3	1	3
	0:15				2	2	2	1	3
	0:20	8	2						
	0:22							6	4
	0:30					2	1	4	2
	1:15		2			4	2	2	
TOTALS:		**9**	**5**	**0**	**3**	**10**	**8**	**14**	**12**

Cattle Preference (23 Apr 25)

DATE	TIME	TT8	TT7	TT6	TT5	TT4	TT3	TT2	TT1
		Misc	1600	800	400	200	Calusolv	100	Calusolv
23-Apr-25	0:05						5	5	3
	0:15							4	9
	0:18					2	2	5	4
	0:20								
	0:22	8	1	1		1	1		
	0:24	12				1			
	0:30	13							
	0:35								
	0:41				2		5	2	3
	0:45	4	1				3	3	2
	0:52	10					2		
	1:23	6				2	2	2	1
	2:00	13							
	3:02	1			1		6		
	3:53							7	6
TOTALS:		**67**	**2**	**1**	**3**	**6**	**26**	**28**	**28**

Unsung Heroes

- You're joining something bigger than yourself
- Our farmers/ranchers are unsung heroes
- What's more noble than growing our food?
- But, the health of your fellow citizens is in your hands

What If?

- Chronic disease rates in our children 40%+
- Autism rates in young children 1/36+
- Obesity rates in citizens 42%+
- Cancer rates 1/2
- Affect our military age youth such that 3/4 couldn’t join the military
- Spend WWII ($5.3 Trillion+) every year

1937

"The nation that destroys its soil destroys itself."

- President Franklin Roosevelt

Soil Enlistment “Oath”

“To the best of my ability, I vow to help promote, and build soil instead of dirt.”

More Info

- www.Libertytracefarm.com
- References “Books and Resources” Tab
- These Slides “Living Soil” Tab
- Links Past Presentations (2024)
  - (Beginner & Advanced)

More Info (Cont)

- Weston Price Foundation (https://www.westonaprice.org/)
- Childrens Health Defense (https://childrenshealthdefense.org/)
- Moms Across America (https://www.momsacrossamerica.com/)
- Howard Vlieger, Firehawk Bioherbicide (https://www.firehawkbioherbicide.com/)