



**“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!



—Owen Gleiberman, *Entertainment Weekly*

YOU'LL NEVER LOOK AT DINNER
THE SAME WAY AGAIN



FOOD, INC.

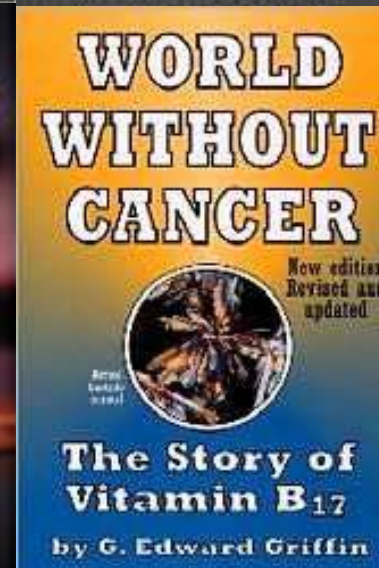
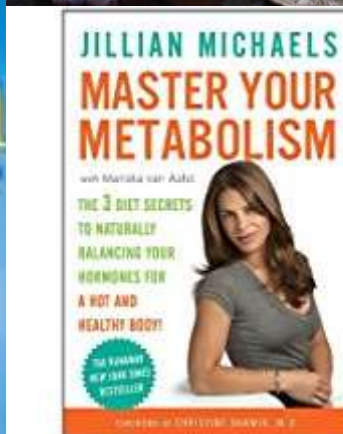
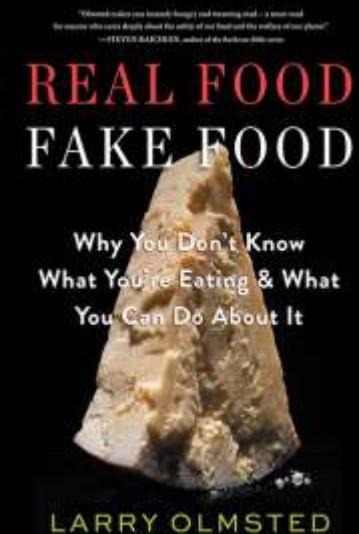
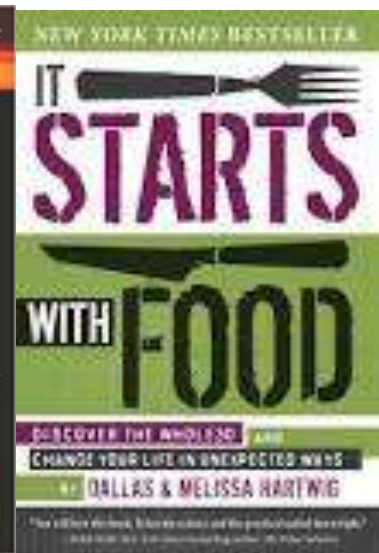
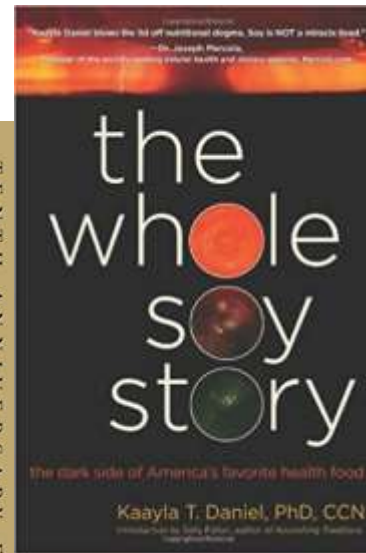
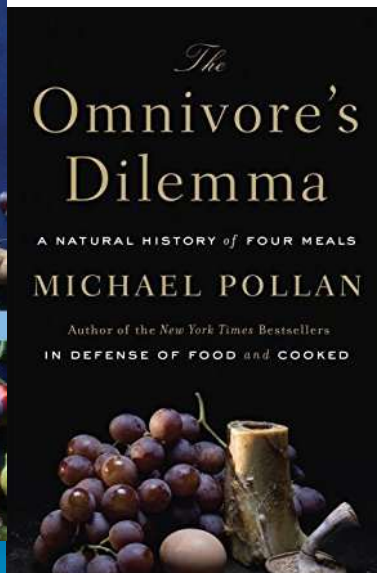
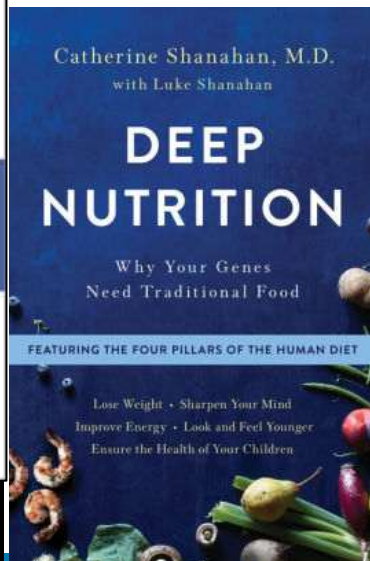
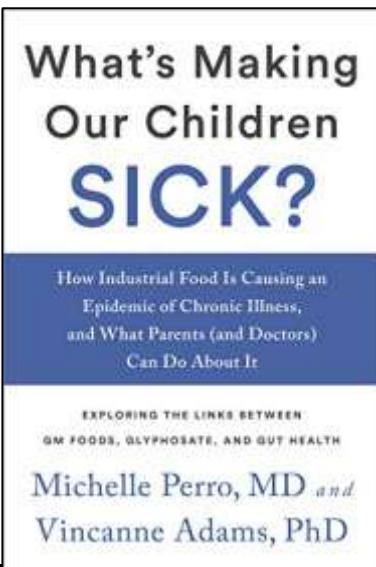
A ROBERT KENNER FILM

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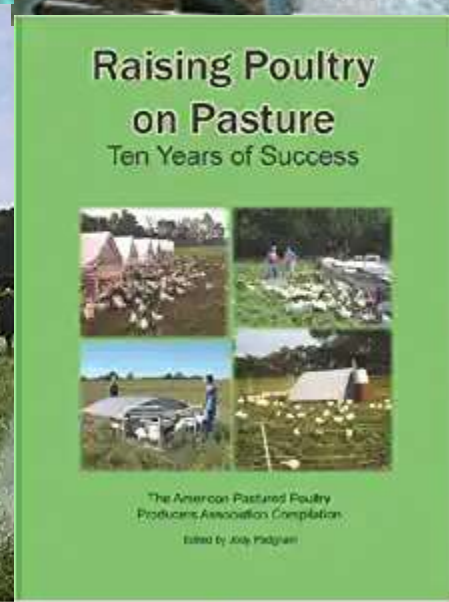
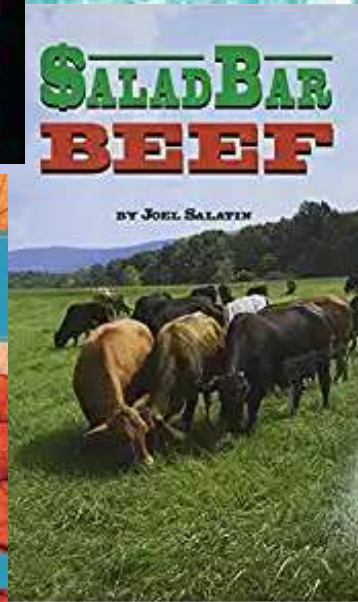
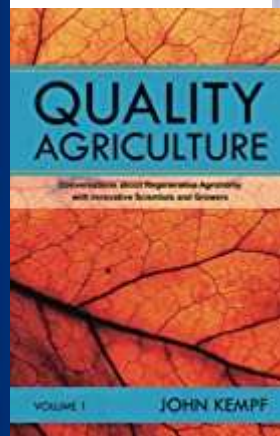
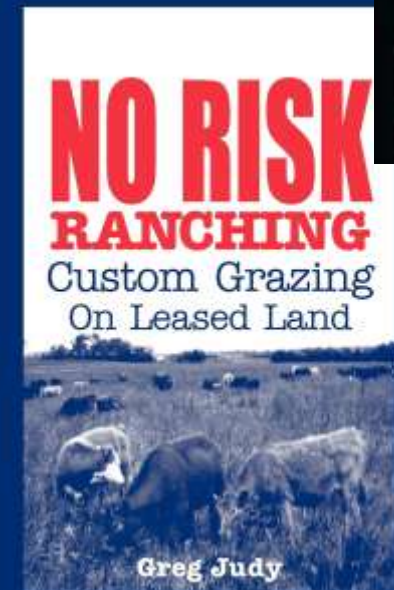
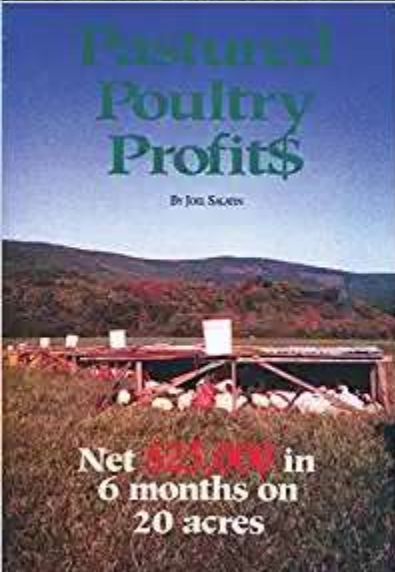
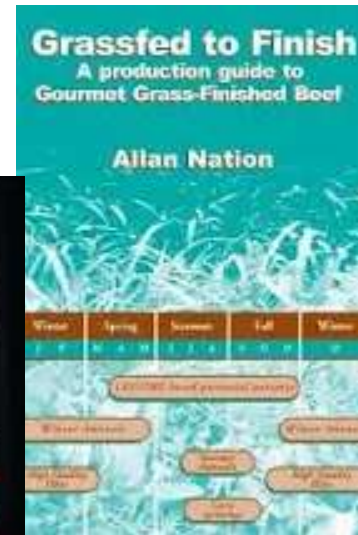
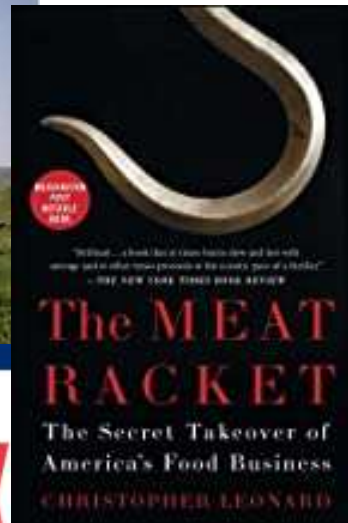
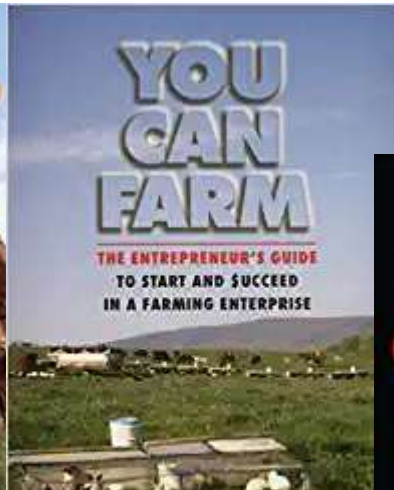
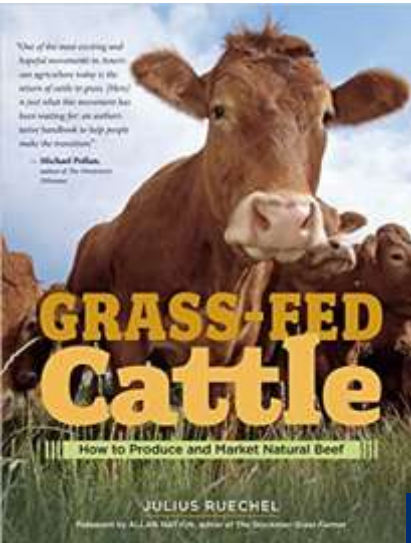
Joel Salatin—Polyface Farm



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????

What's Making Our Children **SICK?**

How Industrial Food Is Causing an
Epidemic of Chronic Illness,
and What Parents (and Doctors)
Can Do About It

EXPLORING THE LINKS BETWEEN
GM FOODS, GLYPHOSATE, AND GUT HEALTH

Michelle Perro, MD *and*
Vincanne Adams, PhD

UNSTOPPABLE



Transforming Sickness and Struggle into Triumph,
Empowerment, and a Celebration of Community

Zen Honeycutt

Founding Executive Director, Moms Across America

Foreword by Jill C. Carrasquas, MD, ABFM, ABHM, IFMCP
Functional Medicine Practitioner, Conventional Cancer's Daughter,
Breast Cancer and Colorectal Cancer Survivor

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

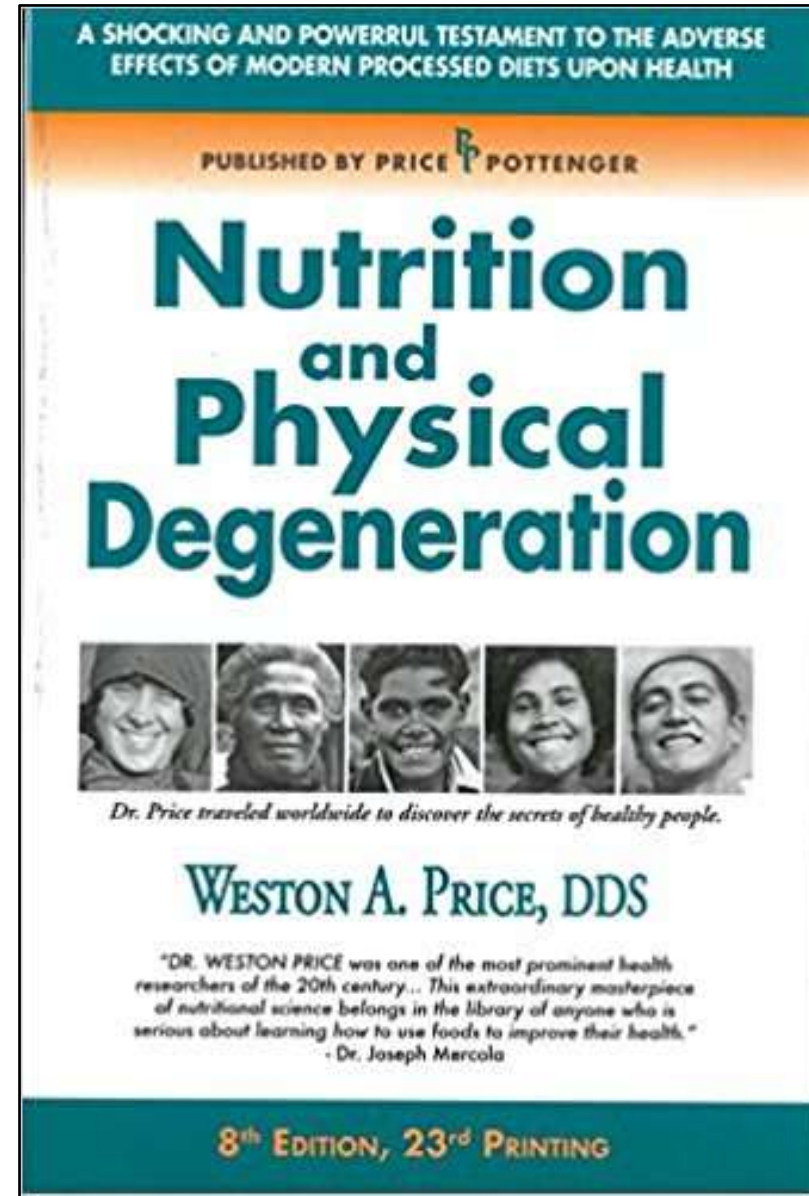
Moms Across America, a nationwide non-profit, has initiated an extensive testing program on the top twenty fast food brands in America, plus one restaurant, California's In-N-Out Burger. Forty-two samples of 21 brands were tested for the most widely used herbicide in the world, glyphosate, 236 agrochemicals, 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



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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



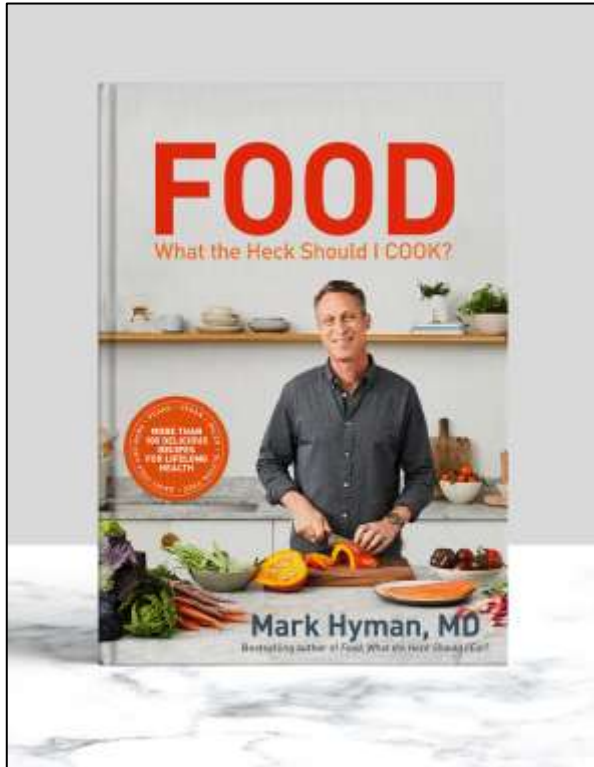
Human Examples

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

WWII Study: Dutch & Nazi Blockade

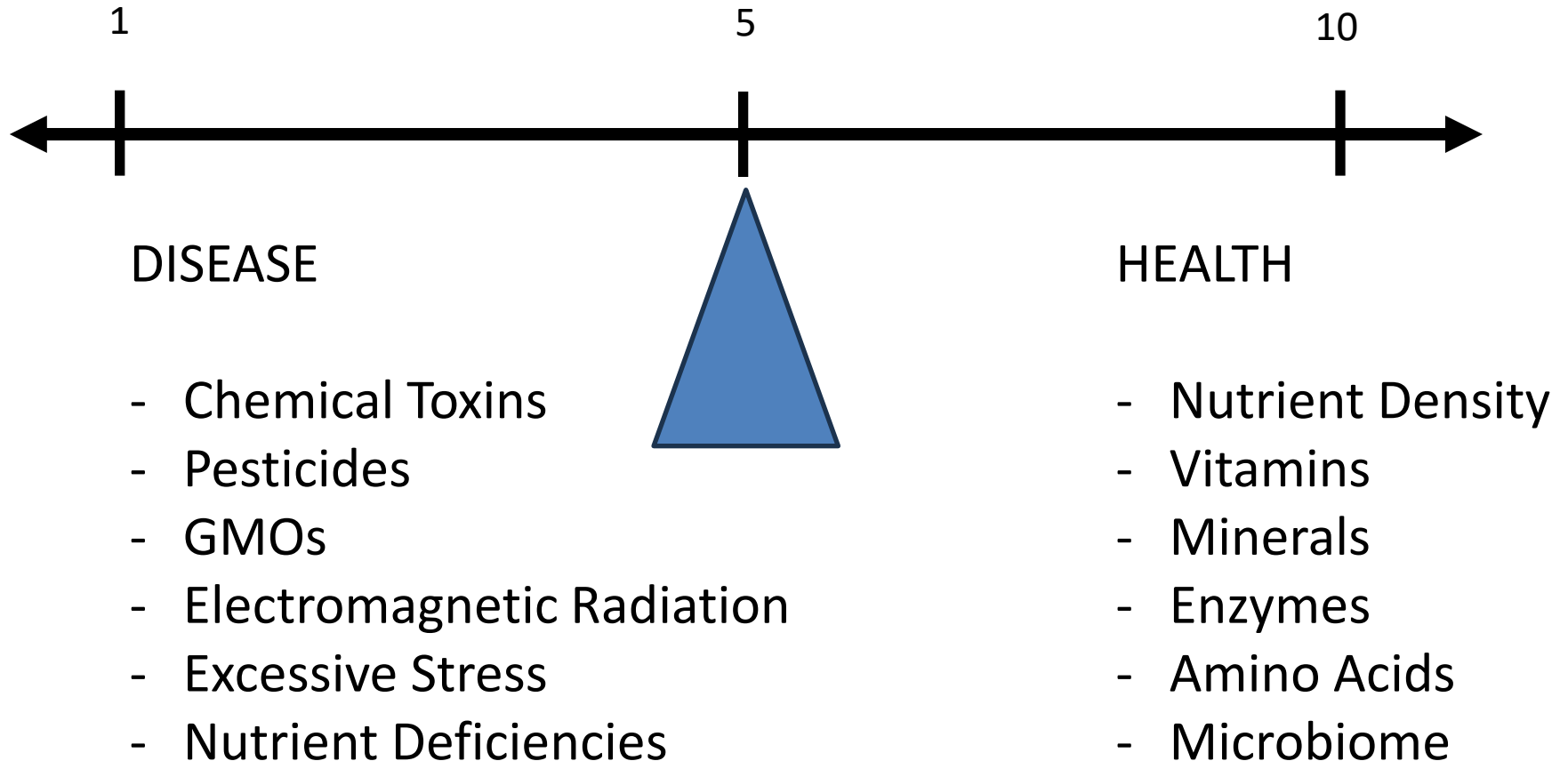
- Human Mother is Nutrient Deficient
 - 1st, 2d, 3d trimester
- Babies as Adults: Epigenetics
 - 1st: Cardiovascular; High Cholesterol, Obesity
 - 2d: Glucose Intolerant; Kidney Disease
 - 3d: Asthma

2024--Dr Mark Hyman



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

Health Range (1-10)



Nutrition Facts
 Serving Size 1/2 cup (65g)
 Servings Per Container 12

Amount Per Serving
Calories 100 **Calories from Fat 60**

	% Daily Value*
Total Fat 7g	11%
Saturated Fat 4.5g	22%
Trans Fat 0g	
Cholesterol 25mg	5%
Sodium 10mg	2%
Potassium 170mg	4%
Total Carbohydrate 14g	5%
Dietary Fiber 0g	0%
Sugars 12g	
Protein 3g	
Vitamin A 0%	Vitamin C 2%
Calcium 0%	Iron 0%

INGREDIENTS: OATS, CREAM, SUGAR, SYRUP, CORN SYRUP, MED. FRUCTOSE, CORN SYRUP, WHITE SNOW BALL, APPLE, COLLAGEN GEL, SUGAR GUM, COLLAGEN GUM, WIND, AND OAT FLOUR. LATEST SUGAR GUM POLYMERIZATE IN CONCORD, MA. ADAPTIVE SUGAR GUM.

CONTAINS: MILK.

DISTRIBUTED BY THE QUAKER CO.
 CONCORD, MA 01742

OVER 50
***TWIN MORE VS. OUR TABLET FORMULATION**

No significant difference has been shown between milk-based formula-treated and non-ibST-treated cows.

NOT FOR INFANTS OR CHILDREN WITH GALACTOSEMIA

Measures 100 Calories 5.3 fl. oz. prepared as directed

WATER	2.1 g	CARBOHYDRATE	11.1 g	URIC ACID	100 mg
SUGAR	1.4 g	SALT	140 g		

VITAMINS

VITAMIN A	250 IU	VITAMIN B1	500 mcg	VITAMIN C	100 mg
VITAMIN B2	1.0 mg	VITAMIN B6	1.0 mg	VITAMIN D	100 IU
VITAMIN B12	1.0 mcg	NICOTINIC ACID	110 mg	VITAMIN E	100 IU
VITAMIN K	100 mcg	FOLIC ACID	10 mcg	VITAMIN P	100 mcg
VITAMIN L	100 mcg	PANTOTHENIC ACID	470 mcg	VITAMIN Q	100 mcg

MINERALS

SODIUM	50 mg	ZINC	10 mg	SILICON	100 mg
POTASSIUM	50 mg	MANGANESE	10 mg	SELENIUM	100 mcg
MAGNESIUM	10 mg	COFFEE	10 mg	PHOSPHORUS	100 mg
IRON	10 mg	LEUCINE	10 mg	CALCIUM	100 mg

INGREDIENTS: SUGAR, MILK, WATER, SALT, CARBOHYDRATE, URIC ACID, VITAMIN A, VITAMIN B1, VITAMIN B2, VITAMIN B6, VITAMIN B12, VITAMIN C, VITAMIN D, VITAMIN E, VITAMIN K, VITAMIN L, VITAMIN P, VITAMIN Q, VITAMIN R, VITAMIN S, VITAMIN T, VITAMIN U, VITAMIN V, VITAMIN W, VITAMIN X, VITAMIN Y, VITAMIN Z, VITAMIN AA, VITAMIN AB, VITAMIN AC, VITAMIN AD, VITAMIN AE, VITAMIN AF, VITAMIN AG, VITAMIN AH, VITAMIN AI, VITAMIN AJ, VITAMIN AK, VITAMIN AL, VITAMIN AM, VITAMIN AN, VITAMIN AO, VITAMIN AP, VITAMIN AQ, VITAMIN AR, VITAMIN AS, VITAMIN AT, VITAMIN AU, VITAMIN AV, VITAMIN AW, VITAMIN AX, VITAMIN AY, VITAMIN AZ, VITAMIN BA, VITAMIN BB, VITAMIN BC, VITAMIN BD, VITAMIN BE, VITAMIN BF, VITAMIN BG, VITAMIN BH, VITAMIN BI, VITAMIN BJ, VITAMIN BK, VITAMIN BL, VITAMIN BM, VITAMIN BN, VITAMIN BO, VITAMIN BP, VITAMIN BQ, VITAMIN BR, VITAMIN BS, VITAMIN BT, VITAMIN BU, VITAMIN BV, VITAMIN BW, VITAMIN BX, VITAMIN BY, VITAMIN BZ, VITAMIN CA, VITAMIN CB, VITAMIN CC, VITAMIN CD, VITAMIN CE, VITAMIN CF, VITAMIN CG, VITAMIN CH, VITAMIN CI, VITAMIN CJ, VITAMIN CK, VITAMIN CL, VITAMIN CM, VITAMIN CN, VITAMIN CO, VITAMIN CP, VITAMIN CQ, VITAMIN CR, VITAMIN CS, VITAMIN CT, VITAMIN CU, VITAMIN CV, VITAMIN CW, VITAMIN CX, VITAMIN CY, VITAMIN CZ, VITAMIN DA, VITAMIN DB, VITAMIN DC, VITAMIN DD, VITAMIN DE, VITAMIN DF, VITAMIN DG, VITAMIN DH, VITAMIN DI, VITAMIN DJ, VITAMIN DK, VITAMIN DL, VITAMIN DM, VITAMIN DN, VITAMIN DO, VITAMIN DP, VITAMIN DQ, VITAMIN DR, VITAMIN DS, VITAMIN DT, VITAMIN DU, VITAMIN DV, VITAMIN DW, VITAMIN DX, VITAMIN DY, VITAMIN DZ, VITAMIN EA, VITAMIN EB, VITAMIN EC, VITAMIN ED, VITAMIN EE, VITAMIN EF, VITAMIN EG, VITAMIN EH, VITAMIN EI, VITAMIN EJ, VITAMIN EK, VITAMIN EL, VITAMIN EM, VITAMIN EN, VITAMIN EO, VITAMIN EP, VITAMIN EQ, VITAMIN ER, VITAMIN ES, VITAMIN ET, VITAMIN EU, VITAMIN EV, VITAMIN EW, VITAMIN EX, VITAMIN EY, VITAMIN EZ, VITAMIN FA, VITAMIN FB, VITAMIN FC, VITAMIN FD, VITAMIN FE, VITAMIN FF, VITAMIN FG, VITAMIN FH, VITAMIN FI, VITAMIN FJ, VITAMIN FK, 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Creamy RANCH DRESSING

Nutrition Facts		Amount/serving	% DV	Amount/serving	% DV
Total Fat 14g		18%	Total Carb. 2g	1%	
Saturated Fat 2.5g		13%	Fiber 0g	0%	
Trans Fat 0g			Total Sugars 1g		
Cholesterol 10mg		3%	Incl. 1g Added Sugars	2%	
Sodium 240mg		10%	Protein 1g		
Calories 130		Vitamin D 0% • Calcium 2% • Iron 0% • Potassium 0%			

Ingredients: SOYBEAN OIL, WATER, NONFAT BUTTERMILK (CULTURED LOWFAT AND SKIM MILK, SA-
TAPICA STARCH, LOCUST BEAN GUM, CARRAGEENAN, EGG YOLK, SUGAR, SOUR CREAM POWDER, CREAM, NONFAT MILK, CULTURED), SALT, VINAGAR, CONTAINS 1% OR LESS OF: SPICE, DRIED GARLIC,
DRIED ONION, PARSLEY, PHOSPHORIC ACID, XANTHAN GUM, MODIFIED CORN STARCH, MONOSODIUM
GLUTAMATE, NATURAL FLAVORS, SODIUM BENZOATE AND POTASSIUM SORBATE (PRESERVATIVES),
CALCIUM DIOXIDE (FDA-170 PROTECT FLAVOR).

CONTAINS MILK, EGG.

DISTRIBUTED BY THE KROGER CO.
CINCINNATI, OHIO 45202

SHAKE WELL BEFORE USE.
REFRIGERATE AFTER OPENING.

QUALITY CHOICE

Folic Acid / Ácido fólico		25%	35%
Vitamin B ₁₂ / Vitamina B ₁₂		25%	35%
Amount in cereal: ½ cup skim milk adds 42 calories, 2mg cholesterol, 51mg sodium, 191mg potassium, 4g total carbohydrate (4g sugar), 4g protein. Cantidad en cereal: ½ taza de leche descremada aporta 42 calorías, 2mg de colesterol, 51mg de sodio, 191mg de potasio, 4g de carbohidratos totales (4g de azúcares), 4g de proteínas.			
** Percent Daily Values are based on a 2,000-calorie diet. Your daily values may be higher or lower depending on your calorie needs. / Los porcentajes de valor diario están basados en una dieta de 2,000 calorías. Sus valores diarios pueden ser mayores o menores dependiendo de sus necesidades calóricas.			
		Calories / Calorías	2,000 2,500
Total Fat / Grasa Total	Less than / Menos de	45g	40g
Saturated Fat / Grasa Saturada	Less than / Menos de	30g	25g
Cholesterol / Colesterol	Less than / Menos de	300mg	300mg
Sodium / Sodio	Less than / Menos de	2,400mg	2,400mg
Potassium / Potasio	Less than / Menos de	3,500mg	3,500mg
Total Carbohydrate / Carbohidratos Totales		300g	375g
Dietary Fiber / Fibra Dietética		25g	30g

Ingredients: Milled corn, sugar, contains 2% or less of malt flavor, salt, BHT for freshness.

Vitamins and Minerals: Iron, vitamin C (ascorbic acid and sodium ascorbate), niacinamide, vitamin B₆ (pyridoxine hydrochloride), vitamin B₂ (riboflavin), vitamin B₁ (thiamine hydrochloride), vitamin A palmitate, folic acid, vitamin D, vitamin B₁₂.

CORN USED IN THIS PRODUCT MAY CONTAIN TRACES OF SOYBEANS.

[illegible]

Nutrition Facts
 Serving Size 2 fl oz (59 mL)
 Amount Per Container 60

Amount Per Serving	
Total Fat	13g
Total Sugar	10g
Total Fat	13g
Total Sugar	10g
Total Fat	13g
Total Sugar	10g

Ingredients: SOYBEAN OIL, WATER, WHOLE EGGS AND EGG YOLKS, VINEGAR, SALT, SUGAR, LEMON JUICE CONCENTRATE, CALCIUM DISODIUM EDTA (USED TO PROTECT QUALITY), NATURAL FLAVORS. **GLUTEN-FREE.**

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 ENGLEWOOD CLIFFS
 NJ 07632
 PRODUCT OF USA

Unilever

Quality of this product is guaranteed.

[illegible]

MOTT'S
Applesauce
APPLE

INGREDIENTS: APPLES, HIGH FRUCTOSE CORN SYRUP, WATER, ASCORBIC ACID (VITAMIN C).

MOTT'S LLP, 5301 LEGACY DRIVE, PLANO, TX 75024.
©2017 MOTT'S LLP

Made from real fruit which may contain seeds, stems or other pieces of natural fruit.

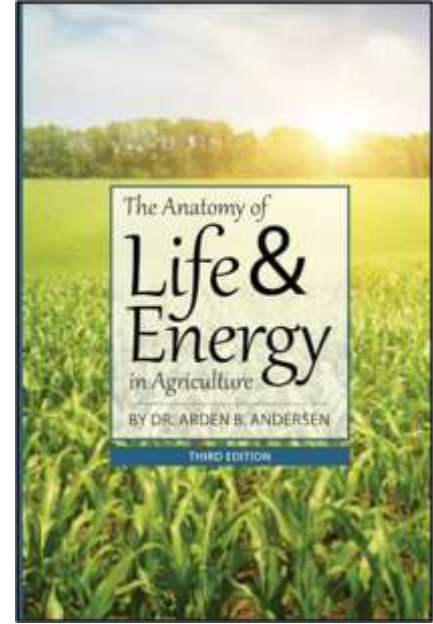
✓ **MADE FROM 100% REAL FRUIT**

100% REAL FRUIT





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



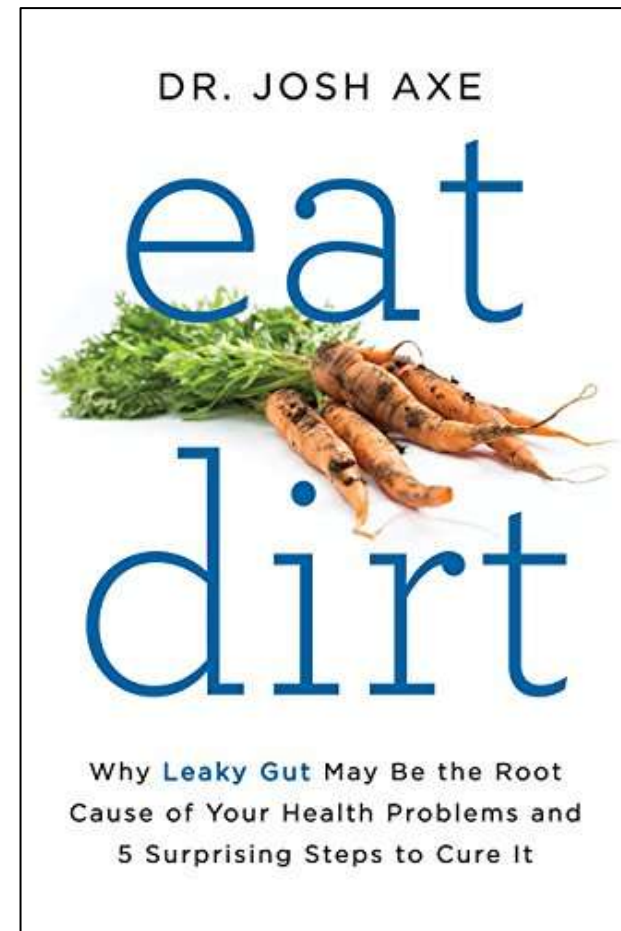
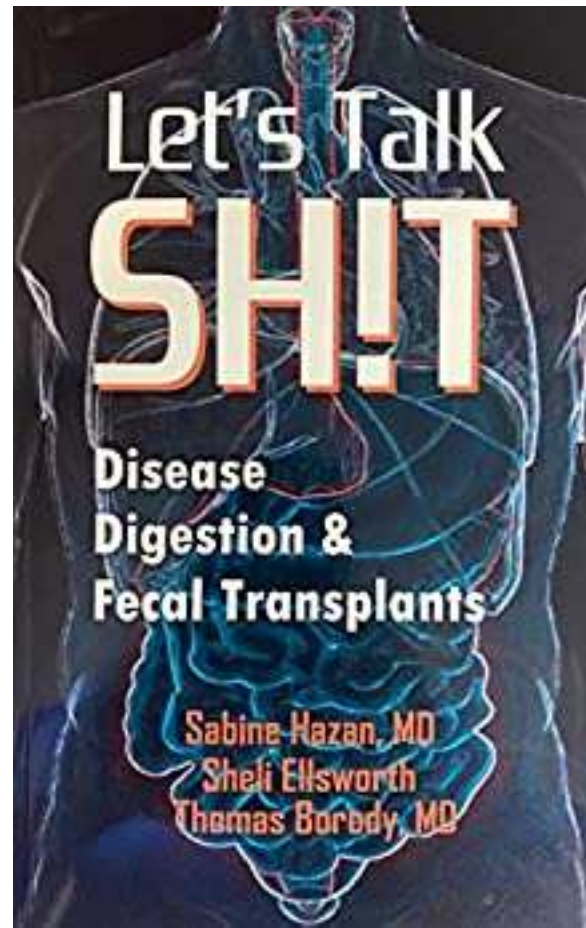
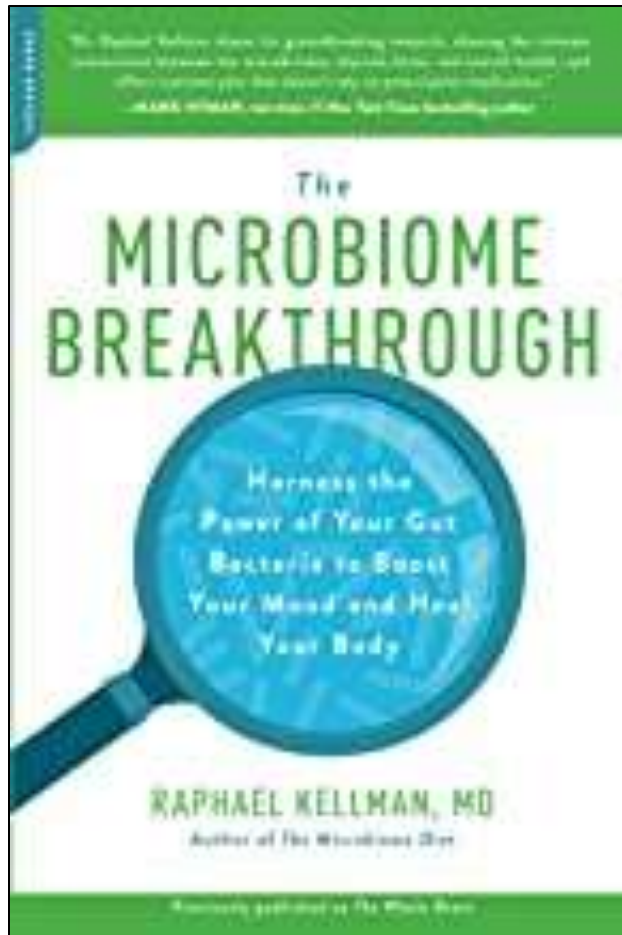
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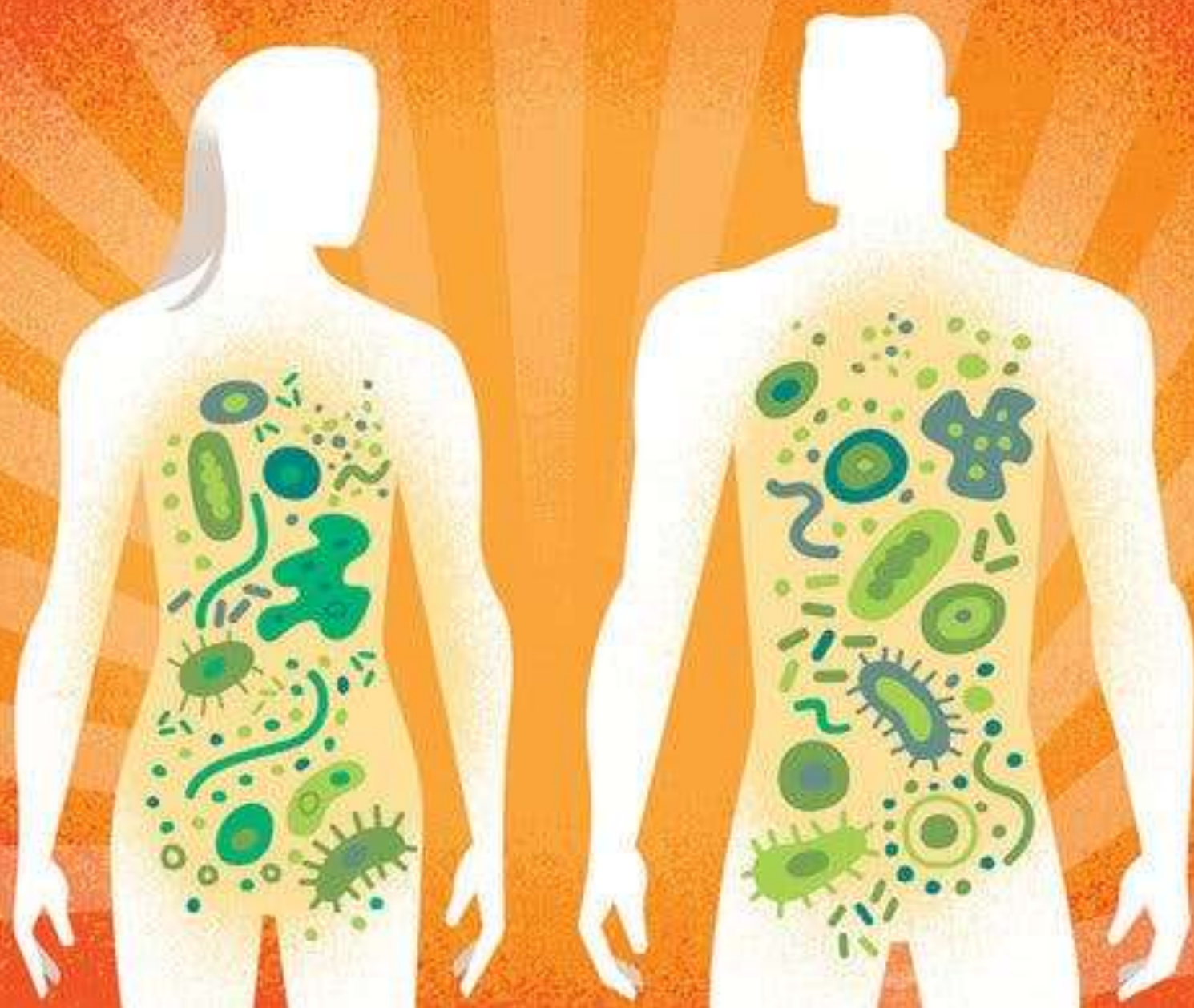
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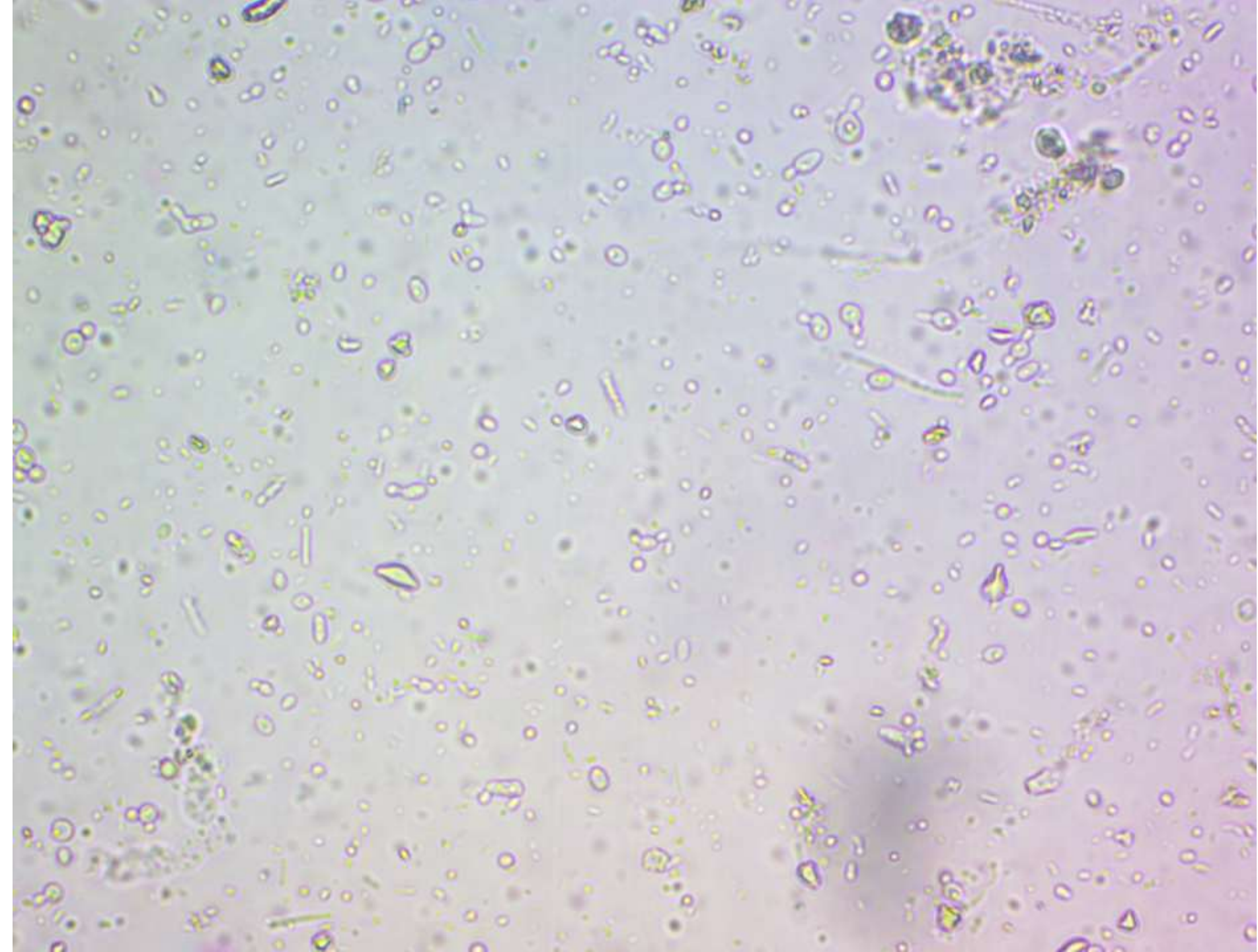
2016 Human Microbiome

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









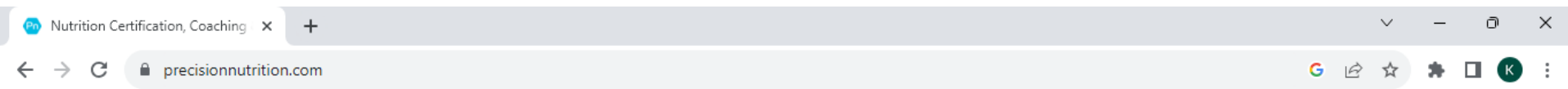
Two Keys to Human Health

✓ **Nutrient Dense Food**

✓ **Healthy Microbiome**

• So...where do they come from?

Health/Nutrition Coach



1-to-1 Coaching Certifications Resources and Articles

Precision Nutrition is the home of the world's top nutrition coaches.

Transforming lives and certifying professionals since 2005.



The New York Times

THE
HUFFINGTON
POST

Women's Health.



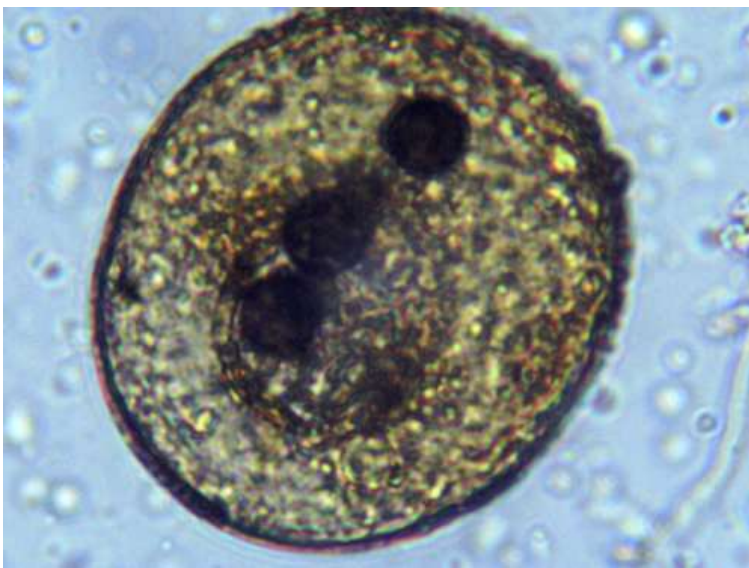
TIME





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



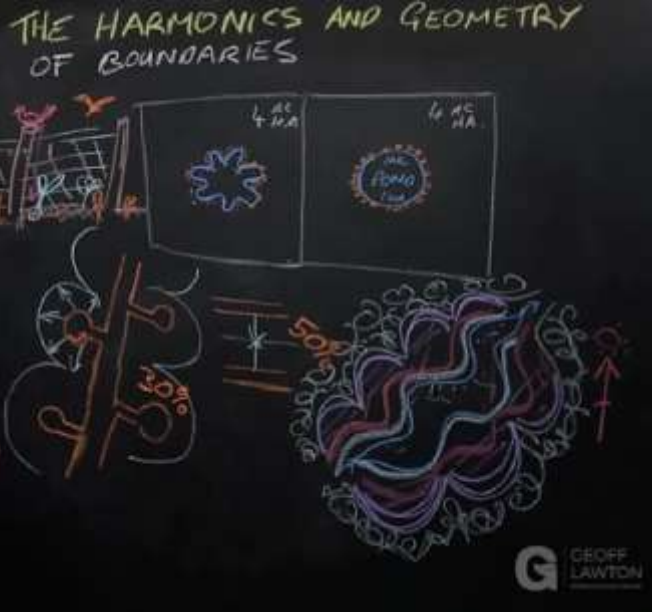
Periodic Table of the Elements

Atomic Number → **1** **H** ← Symbol
Name → **Hydrogen** ← Atomic Weight

State of matter (color of box):
■ Solid ■ Liquid ■ Gas ■ Plasma

Background color categories:
■ Alkali metal ■ Alkaline earth metal ■ Metalloid ■ Nonmetal
■ Lanthanide ■ Actinide ■ Polyatomic nonmetal ■ Noble gas
■ Transition metal ■ Rare earth metal ■ Group 11 metal ■ Group 12 metal

1 H Hydrogen 1.008	2 He Helium 4.0026																	18 Ar Argon 39.948	19 K Potassium 39.0983	20 Ca Calcium 40.078											36 Kr Krypton 83.798	37 Rb Rubidium 85.4678	38 Sr Strontium 87.62											54 Xe Xenon 131.29	55 Cs Cesium 132.9054	56 Ba Barium 137.327											86 Rn Radon 222	87 Fr Francium [223]	88 Ra Radium [226]											118 Og Oganesson [294]																																															
																		10 B Boron 10.811	11 Li Lithium 6.941	12 Be Beryllium 9.0122																	32 S Sulfur 32.06	33 P Phosphorus 30.9738	34 Se Selenium 78.96	35 Br Bromine 79.904	36 Kr Krypton 83.798	37 Rb Rubidium 85.4678	38 Sr Strontium 87.62																	52 Te Tellurium 127.6	53 I Iodine 126.905	54 Xe Xenon 131.29	55 Cs Cesium 132.9054	56 Ba Barium 137.327																	84 At Astatine [210]	85 Po Polonium [209]	86 Rn Radon 222	87 Fr Francium [223]	88 Ra Radium [226]																	116 Lv Livermorium [293]	117 Ts Tennessine [294]	118 Og Oganesson [294]													
																		13 Al Aluminum 26.9815	14 Si Silicon 28.0855	15 P Phosphorus 30.9738	16 S Sulfur 32.06	17 Cl Chlorine 35.453	18 Ar Argon 39.948	19 K Potassium 39.0983	20 Ca Calcium 40.078																	30 Zn Zinc 65.38	31 Ga Gallium 69.723	32 Ge Germanium 72.630	33 As Arsenic 74.9216	34 Se Selenium 78.96	35 Br Bromine 79.904	36 Kr Krypton 83.798	37 Rb Rubidium 85.4678	38 Sr Strontium 87.62																	50 Sn Tin 118.710	51 Sb Antimony 121.757	52 Te Tellurium 127.6	53 I Iodine 126.905	54 Xe Xenon 131.29	55 Cs Cesium 132.9054	56 Ba Barium 137.327																	82 Pb Lead 207.2	83 Bi Bismuth 208.980	84 At Astatine [210]	85 Po Polonium [209]	86 Rn Radon 222	87 Fr Francium [223]	88 Ra Radium [226]																	114 Cn Copernicium [285]	115 Nh Nihonium [286]	116 Lv Livermorium [293]	117 Ts Tennessine [294]	118 Og Oganesson [294]
																		9 Be Beryllium 9.0122	10 B Boron 10.811	11 Li Lithium 6.941	12 Ca Calcium 40.078	13 Sc Scandium 44.9559	14 Ti Titanium 47.88	15 V Vanadium 50.9415	16 Cr Chromium 51.9961	17 Mn Manganese 54.9380	18 Fe Iron 55.845	19 Co Cobalt 58.9332	20 Ni Nickel 58.6934	21 Cu Copper 63.546	22 Zn Zinc 65.38	23 Ga Gallium 69.723	24 Ge Germanium 72.630	25 As Arsenic 74.9216	26 Se Selenium 78.96	27 Br Bromine 79.904	28 Kr Krypton 83.798	29 Rb Rubidium 85.4678	30 Sr Strontium 87.62																	48 Cd Cadmium 112.411	49 In Indium 114.818	50 Sn Tin 118.710	51 Sb Antimony 121.757	52 Te Tellurium 127.6	53 I Iodine 126.905	54 Xe Xenon 131.29	55 Cs Cesium 132.9054	56 Ba Barium 137.327																	80 Hg Mercury 200.59	81 Tl Thallium 204.383	82 Pb Lead 207.2	83 Bi Bismuth 208.980	84 At Astatine [210]	85 Po Polonium [209]	86 Rn Radon 222	87 Fr Francium [223]	88 Ra Radium [226]																	112 Cn Copernicium [285]	113 Nh Nihonium [286]	114 Lv Livermorium [293]	115 Ts Tennessine [294]	116 Og Oganesson [294]							
																		7 Li Lithium 6.941	8 Be Beryllium 9.0122	9 Sc Scandium 44.9559	10 Ti Titanium 47.88	11 V Vanadium 50.9415	12 Cr Chromium 51.9961	13 Mn Manganese 54.9380	14 Fe Iron 55.845	15 Co Cobalt 58.9332	16 Ni Nickel 58.6934	17 Cu Copper 63.546	18 Zn Zinc 65.38	19 Ga Gallium 69.723	20 Ge Germanium 72.630	21 As Arsenic 74.9216	22 Se Selenium 78.96	23 Br Bromine 79.904	24 Kr Krypton 83.798	25 Rb Rubidium 85.4678	26 Sr Strontium 87.62																	46 Cd Cadmium 112.411	47 In Indium 114.818	48 Sn Tin 118.710	49 Sb Antimony 121.757	50 Te Tellurium 127.6	51 I Iodine 126.905	52 Xe Xenon 131.29	53 Cs Cesium 132.9054	54 Ba Barium 137.327																	78 Hg Mercury 200.59	79 Tl Thallium 204.383	80 Pb Lead 207.2	81 Bi Bismuth 208.980	82 At Astatine [210]	83 Po Polonium [209]	84 Rn Radon 222	85 Fr Francium [223]	86 Ra Radium [226]																	110 Cn Copernicium [285]	111 Nh Nihonium [286]	112 Lv Livermorium [293]	113 Ts Tennessine [294]	114 Og Oganesson [294]									
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																		5 Li Lithium 6.941	6 Be Beryllium 9.0122	7 Sc Scandium 44.9559	8 Ti Titanium 47.88	9 V Vanadium 50.9415	10 Cr Chromium 51.9961	11 Mn Manganese 54.9380	12 Fe Iron 55.845	13 Co Cobalt 58.9332	14 Ni Nickel 58.6934	15 Cu Copper 63.546	16 Zn Zinc 65.38	17 Ga Gallium 69.723	18 Ge Germanium 72.630	19 As Arsenic 74.9216	20 Se Selenium 78.96	21 Br Bromine 79.904	22 Kr Krypton 83.798	23 Rb Rubidium 85.4678	24 Sr Strontium 87.62																	42 Cd Cadmium 112.411	43 In Indium 114.818	44 Sn Tin 118.710	45 Sb Antimony 121.757	46 Te Tellurium 127.6	47 I Iodine 126.905	48 Xe Xenon 131.29	49 Cs Cesium 132.9054	50 Ba Barium 137.327																	74 Hg Mercury 200.59	75 Tl Thallium 204.383	76 Pb Lead 207.2	77 Bi Bismuth 208.980	78 At Astatine [210]	79 Po Polonium [209]	80 Rn Radon 222	81 Fr Francium [223]	82 Ra Radium [226]																	106 Cn Copernicium [285]	107 Nh Nihonium [286]	108 Lv Livermorium [293]	109 Ts Tennessine [294]	110 Og Oganesson [294]									
																		4 Li Lithium 6.941	5 Be Beryllium 9.0122	6 Sc Scandium 44.9559	7 Ti Titanium 47.88	8 V Vanadium 50.9415	9 Cr Chromium 51.9961	10 Mn Manganese 54.9380	11 Fe Iron 55.845	12 Co Cobalt 58.9332	13 Ni Nickel 58.6934	14 Cu Copper 63.546	15 Zn Zinc 65.38	16 Ga Gallium 69.723	17 Ge Germanium 72.630	18 As Arsenic 74.9216	19 Se Selenium 78.96	20 Br Bromine 79.904	21 Kr Krypton 83.798	22 Rb Rubidium 85.4678	23 Sr Strontium 87.62																	40 Cd Cadmium 112.411	41 In Indium 114.818	42 Sn Tin 118.710	43 Sb Antimony 121.757	44 Te Tellurium 127.6	45 I Iodine 126.905	46 Xe Xenon 131.29	47 Cs Cesium 132.9054	48 Ba Barium 137.327																	72 Hg Mercury 200.59	73 Tl Thallium 204.383	74 Pb Lead 207.2	75 Bi Bismuth 208.980	76 At Astatine [210]	77 Po Polonium [209]	78 Rn Radon 222	79 Fr Francium [223]	80 Ra Radium [226]																	104 Cn Copernicium [285]	105 Nh Nihonium [286]	106 Lv Livermorium [293]	107 Ts Tennessine [294]	108 Og Oganesson [294]									
																		3 Li Lithium 6.941	4 Be Beryllium 9.0122	5 Sc Scandium 44.9559	6 Ti Titanium 47.88	7 V Vanadium 50.9415	8 Cr Chromium 51.9961	9 Mn Manganese 54.9380	10 Fe Iron 55.845	11 Co Cobalt 58.9332	12 Ni Nickel 58.6934	13 Cu Copper 63.546	14 Zn Zinc 65.38	15 Ga Gallium 69.723	16 Ge Germanium 72.630	17 As Arsenic 74.9216	18 Se Selenium 78.96	19 Br Bromine 79.904	20 Kr Krypton 83.798	21 Rb Rubidium 85.4678	22 Sr Strontium 87.62																	38 Cd Cadmium 112.411	39 In Indium 114.818	40 Sn Tin 118.710	41 Sb Antimony 121.757	42 Te Tellurium 127.6	43 I Iodine 126.905	44 Xe Xenon 131.29	45 Cs Cesium 132.9054	46 Ba Barium 137.327																	70 Hg Mercury 200.59	71 Tl Thallium 204.383	72 Pb Lead 207.2	73 Bi Bismuth 208.980	74 At Astatine [210]	75 Po Polonium [209]	76 Rn Radon 222	77 Fr Francium [223]	78 Ra Radium [226]																	102 Cn Copernicium [285]	103 Nh Nihonium [286]	104 Lv Livermorium [293]	105 Ts Tennessine [294]	106 Og Oganesson [294]									
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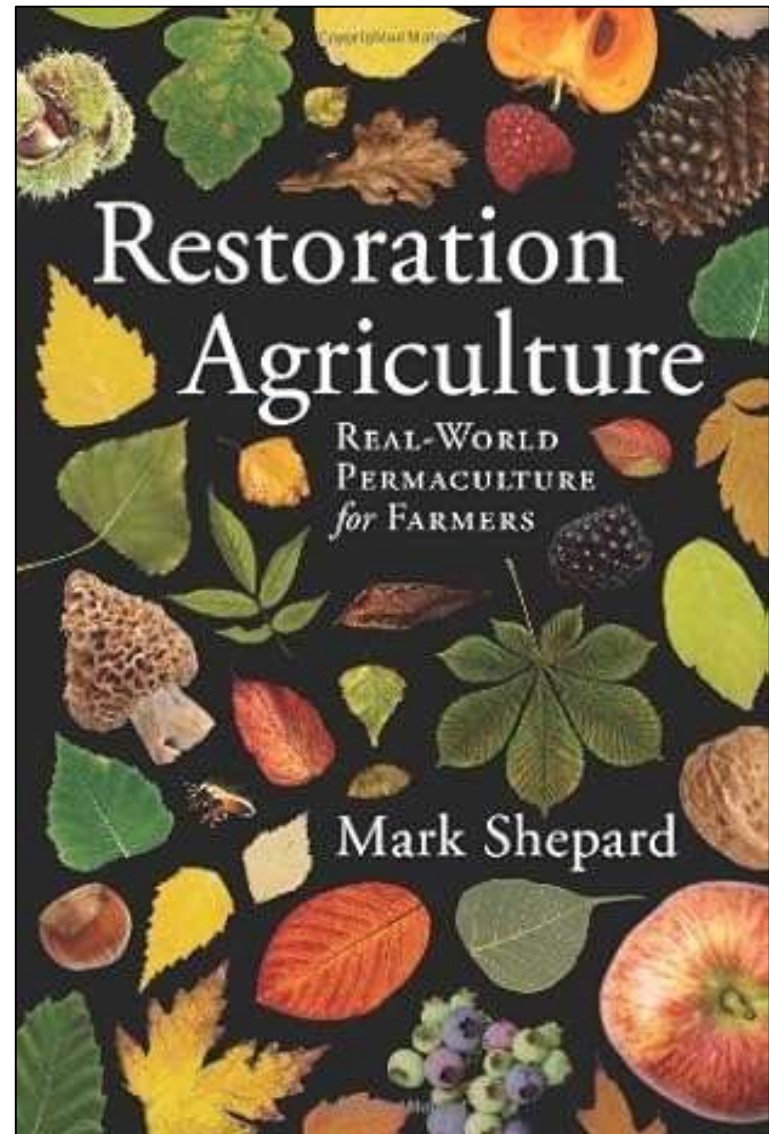
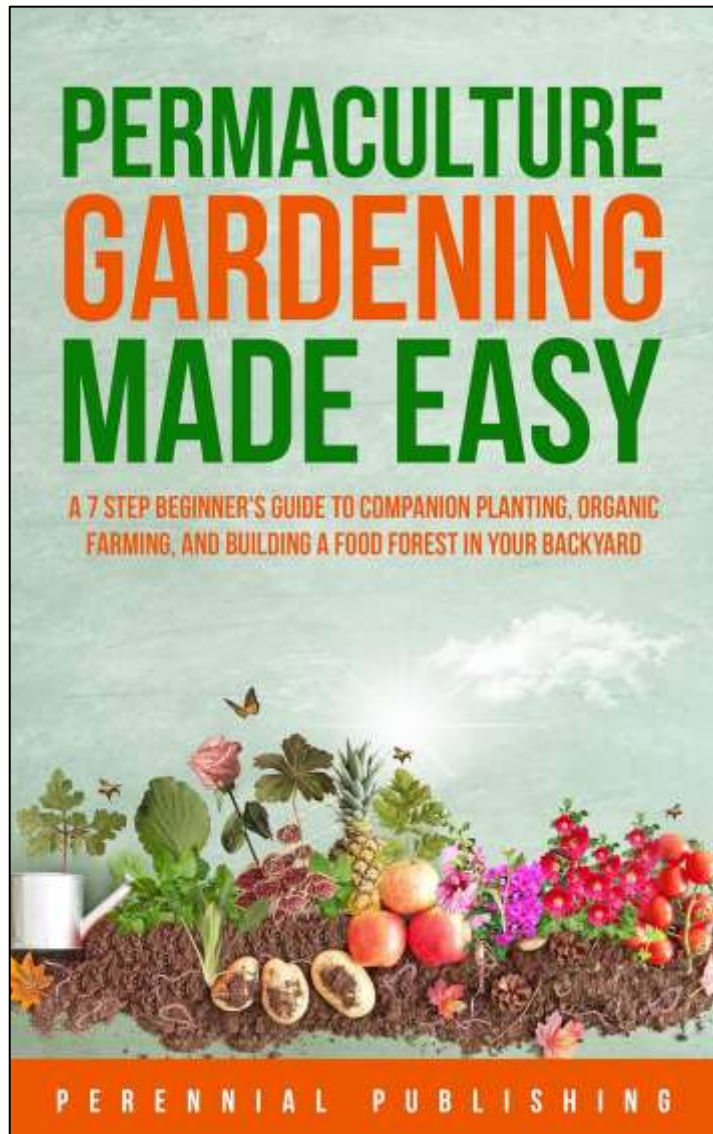


Geoff Lawton's

Permaculture Design Certification

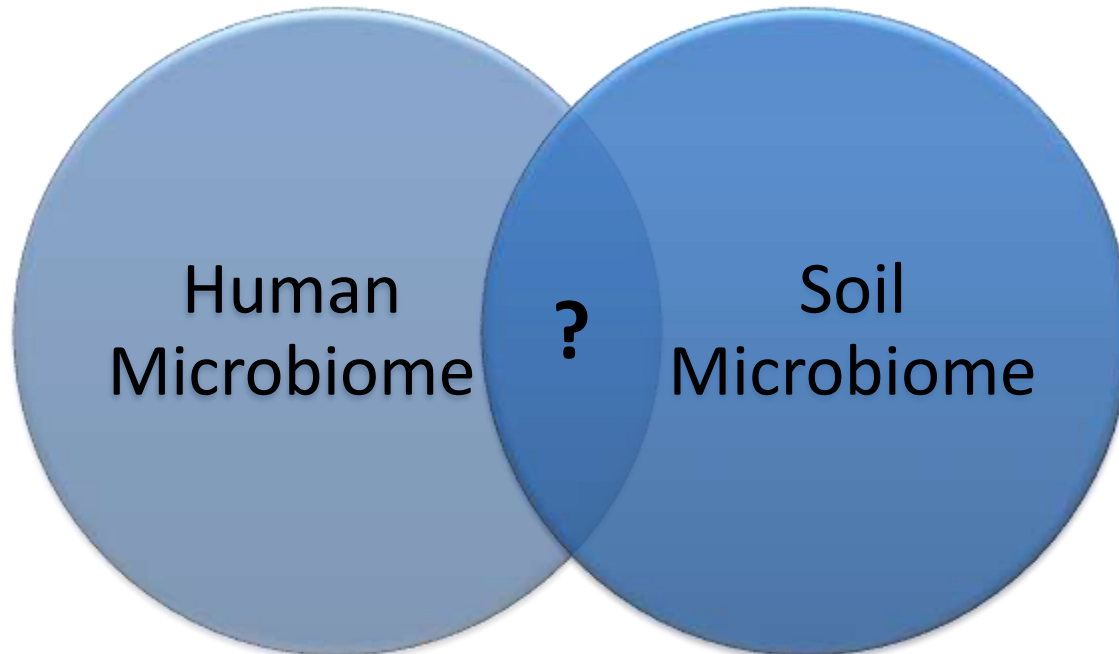


Permaculture for the Homesteader



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

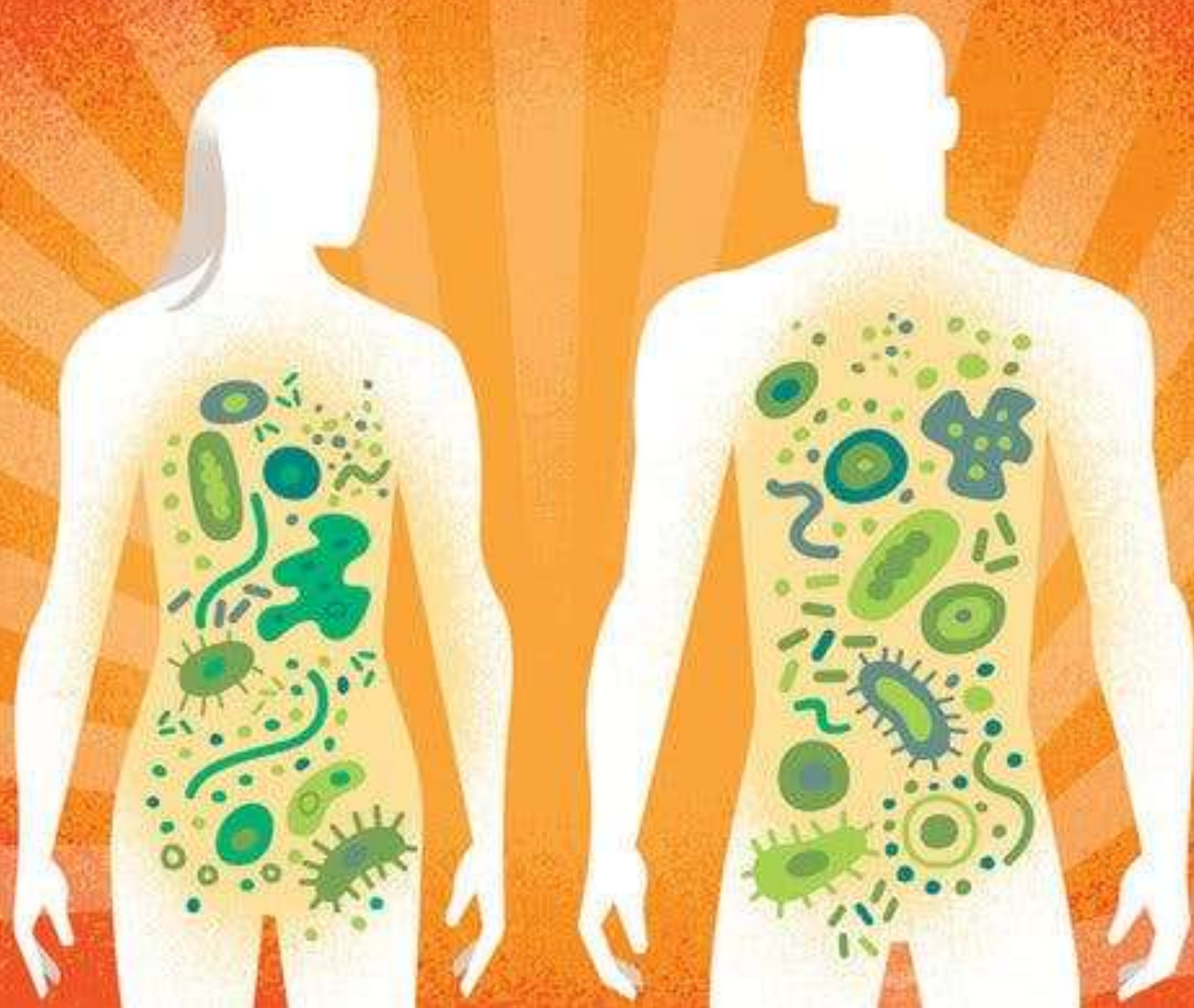




Symptoms of “Dirt”

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

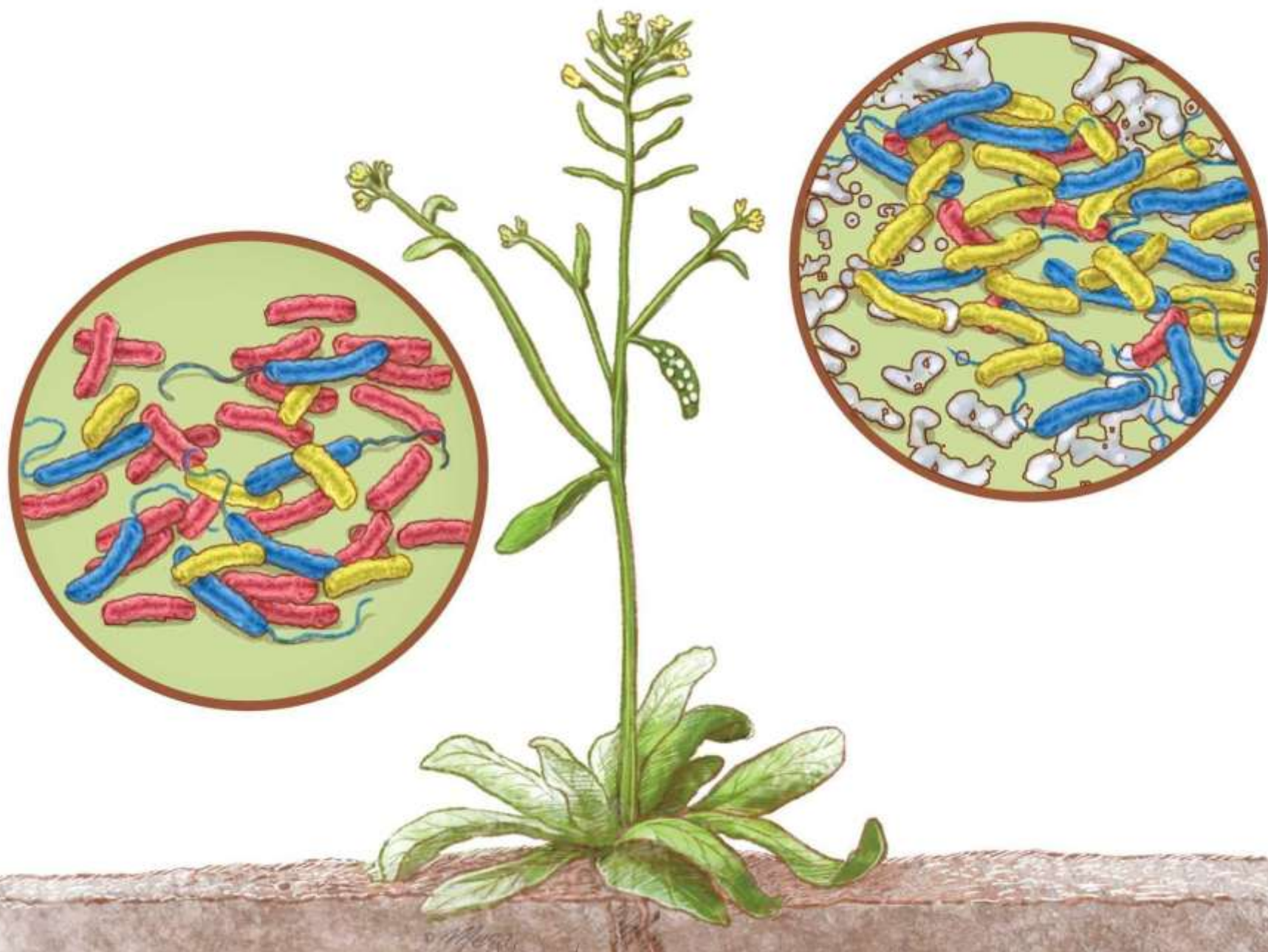




(Patterns of Nature)

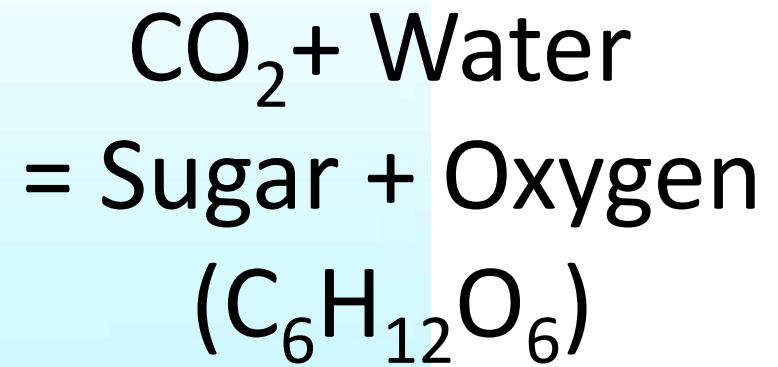
Plants have Microbiome Too!!

- 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





Photosynthesis



(A) Root System Architecture

Spatially distinct communities

(E) Bacterial associations

(B) Chemical Gradients

(D) Mycorrhizal interactions

(C) Nematodal interactions

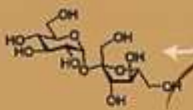
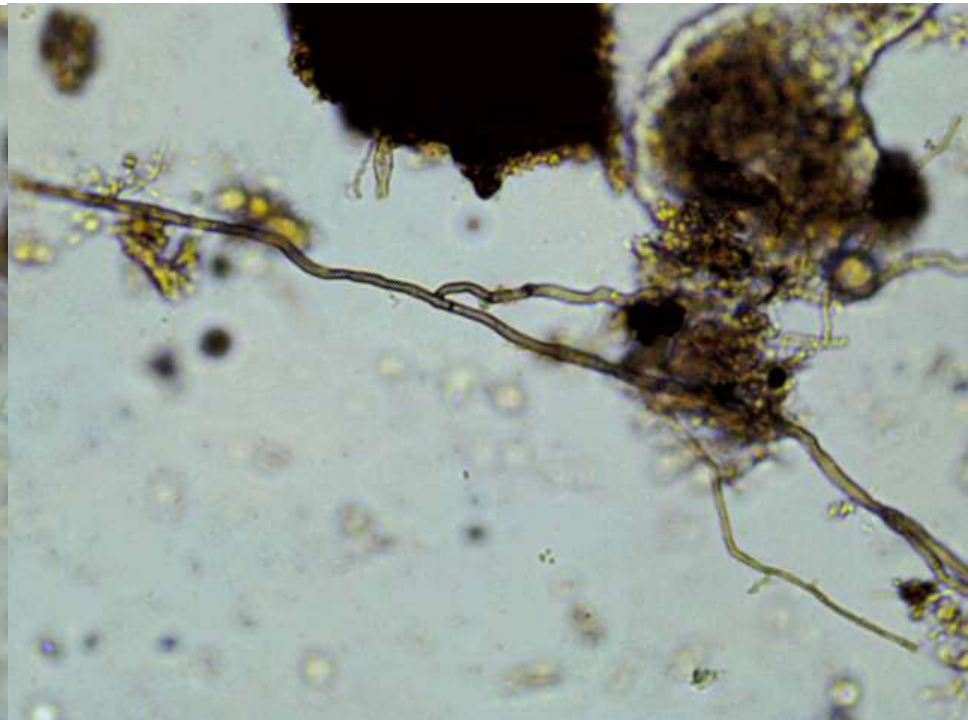


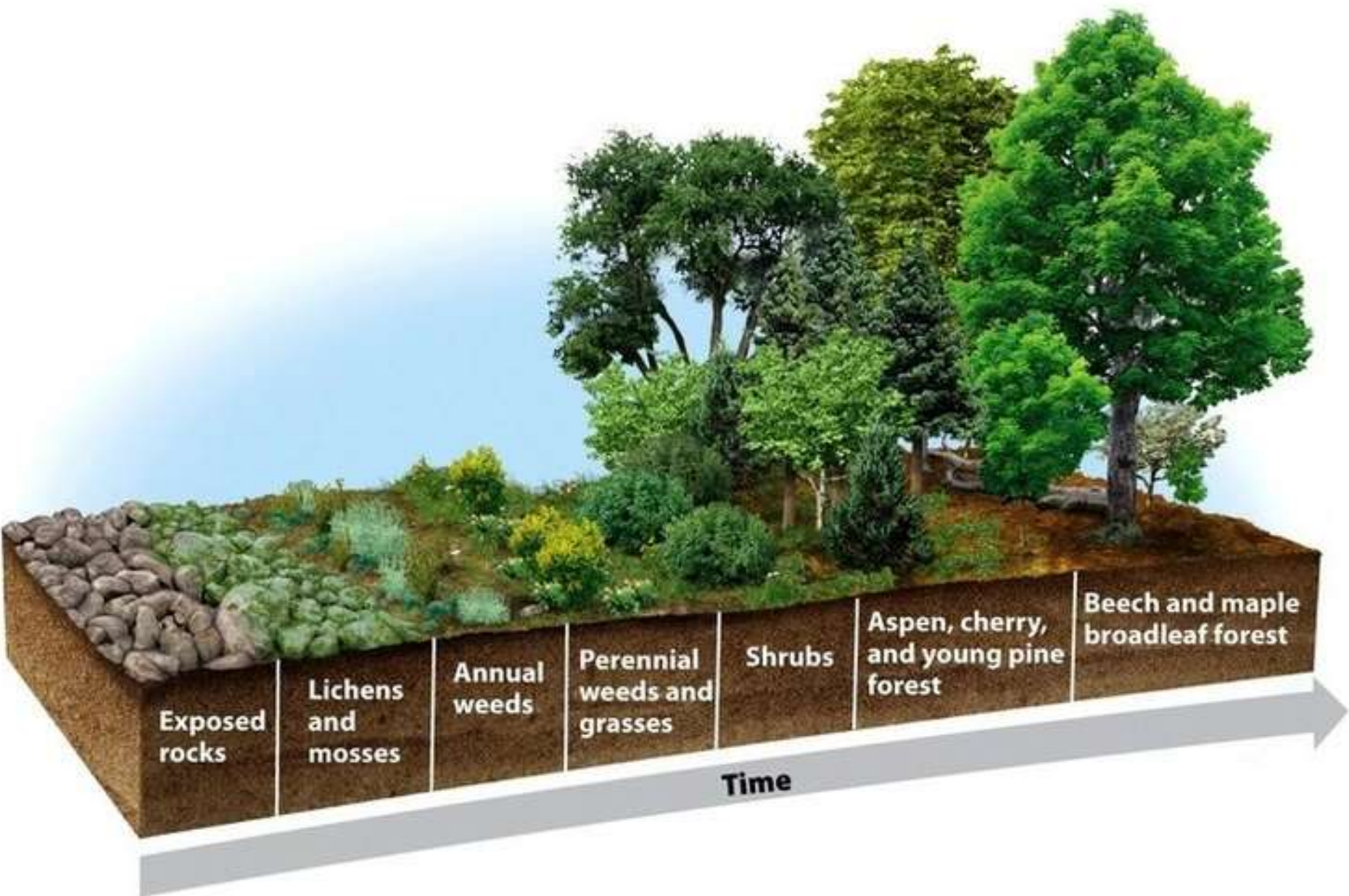


Photo Source: Soil Science Society of America

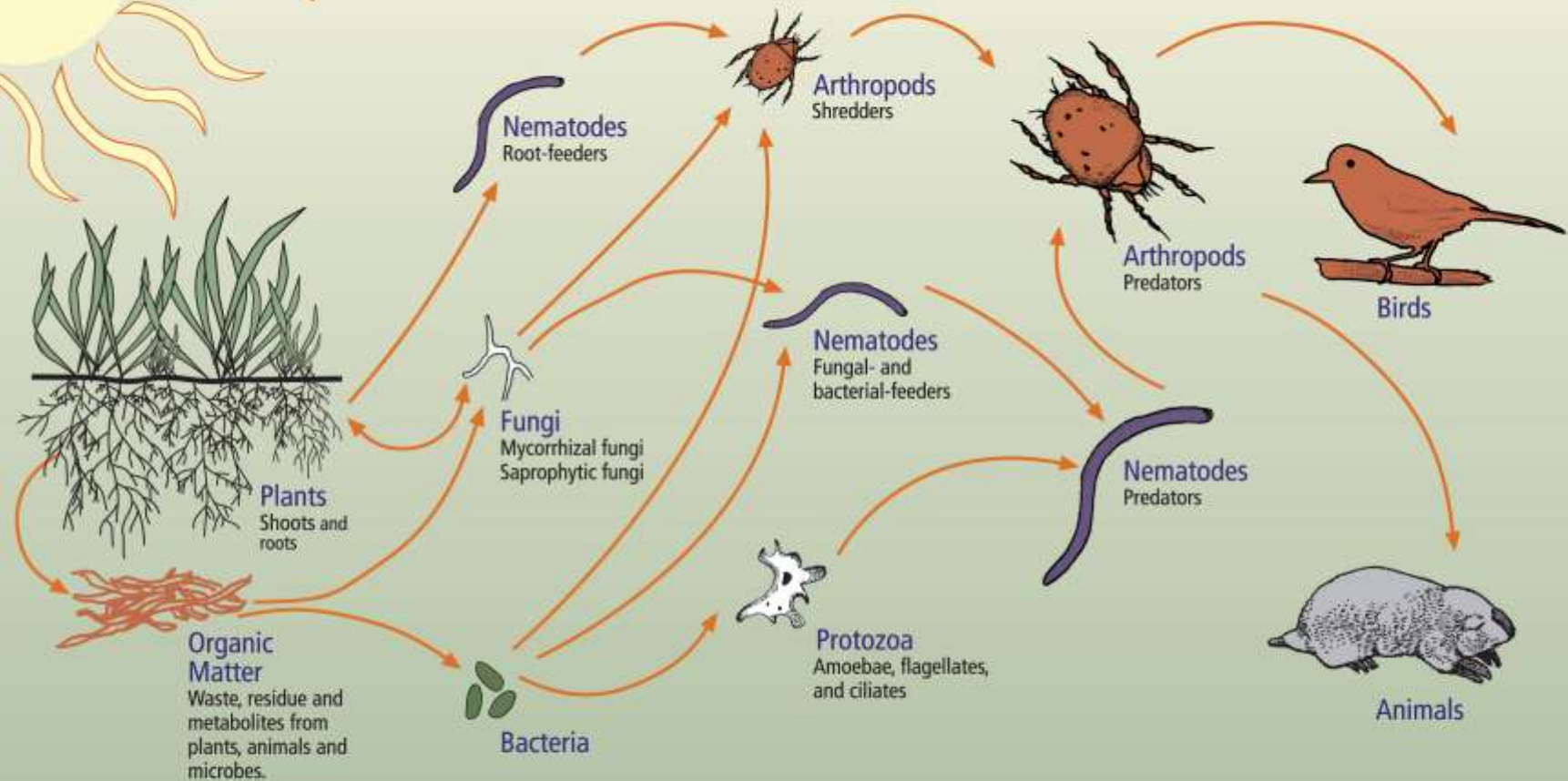
Periodic Table of the Elements

The periodic table is organized into groups and periods. The groups are labeled at the top: 1A, 2A, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18. The periods are labeled on the left: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800,





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

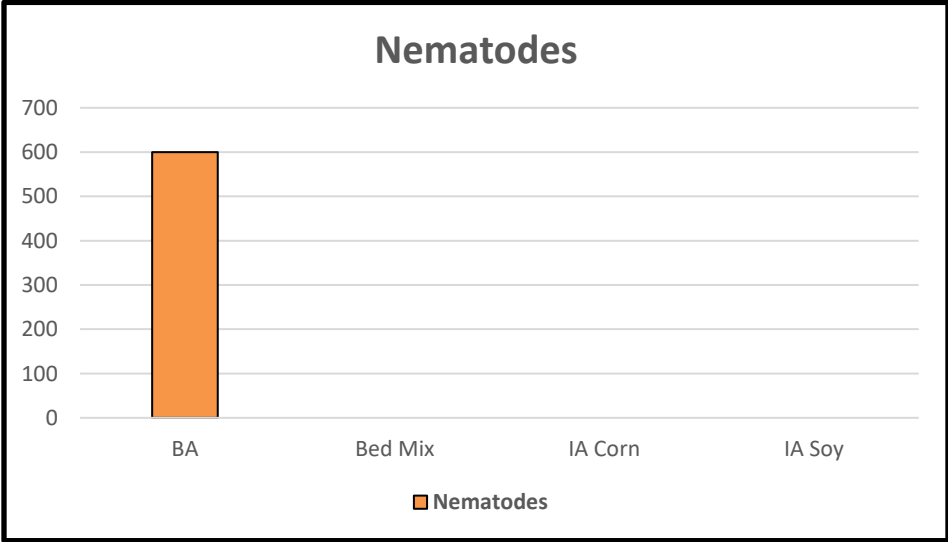
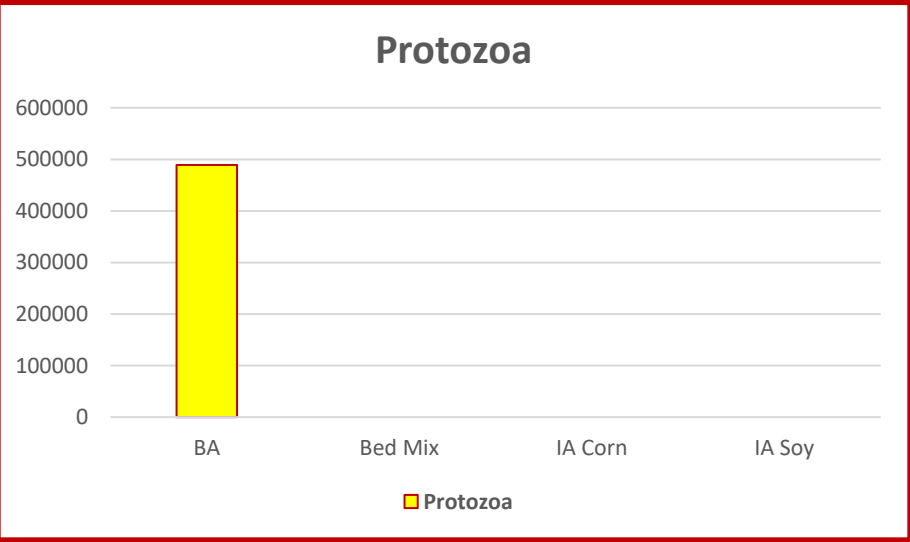
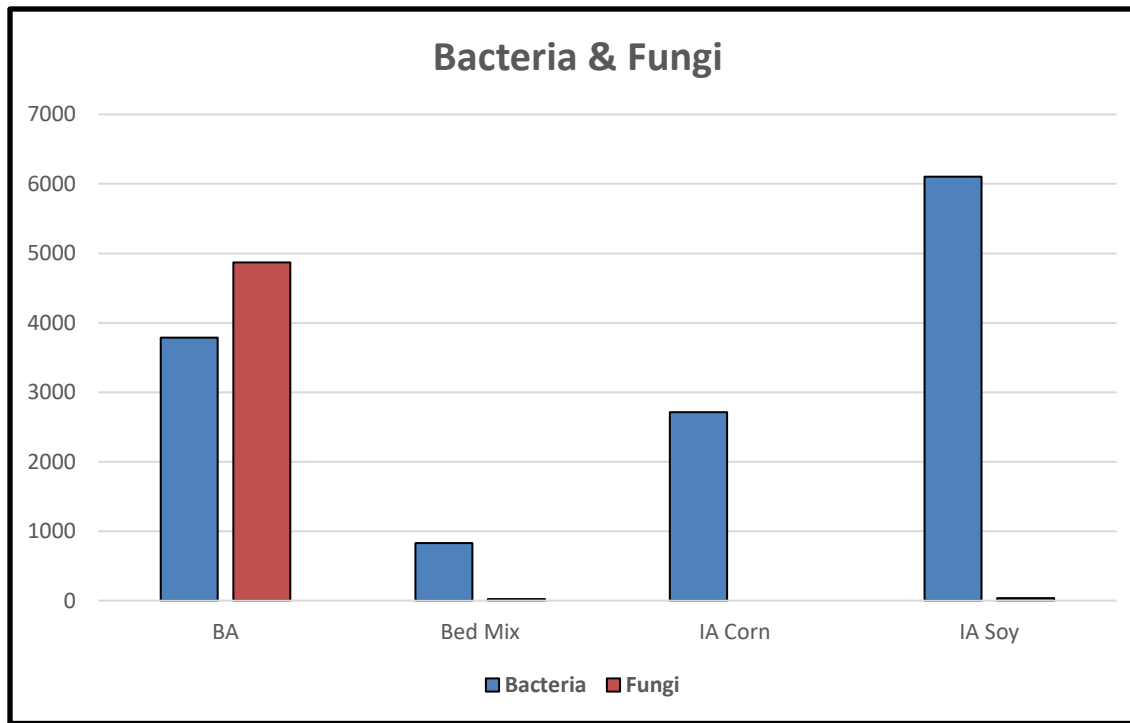
pH		Phosphorus	Potassium	Calcium	Magnesium	Zinc	Iron	Manganese	Boron	Sodium
Soil pH	Buffer Value	P	K	Ca	Mg	Zn	Fe	Mn	B	Na
		Pounds per acre - Mehlich 1								
6.65		25 M	84 L	1842 S	140 S	2.3 S	17 S	20 S	0.5	12

Crop/plant Interpretation ranges on last sheet

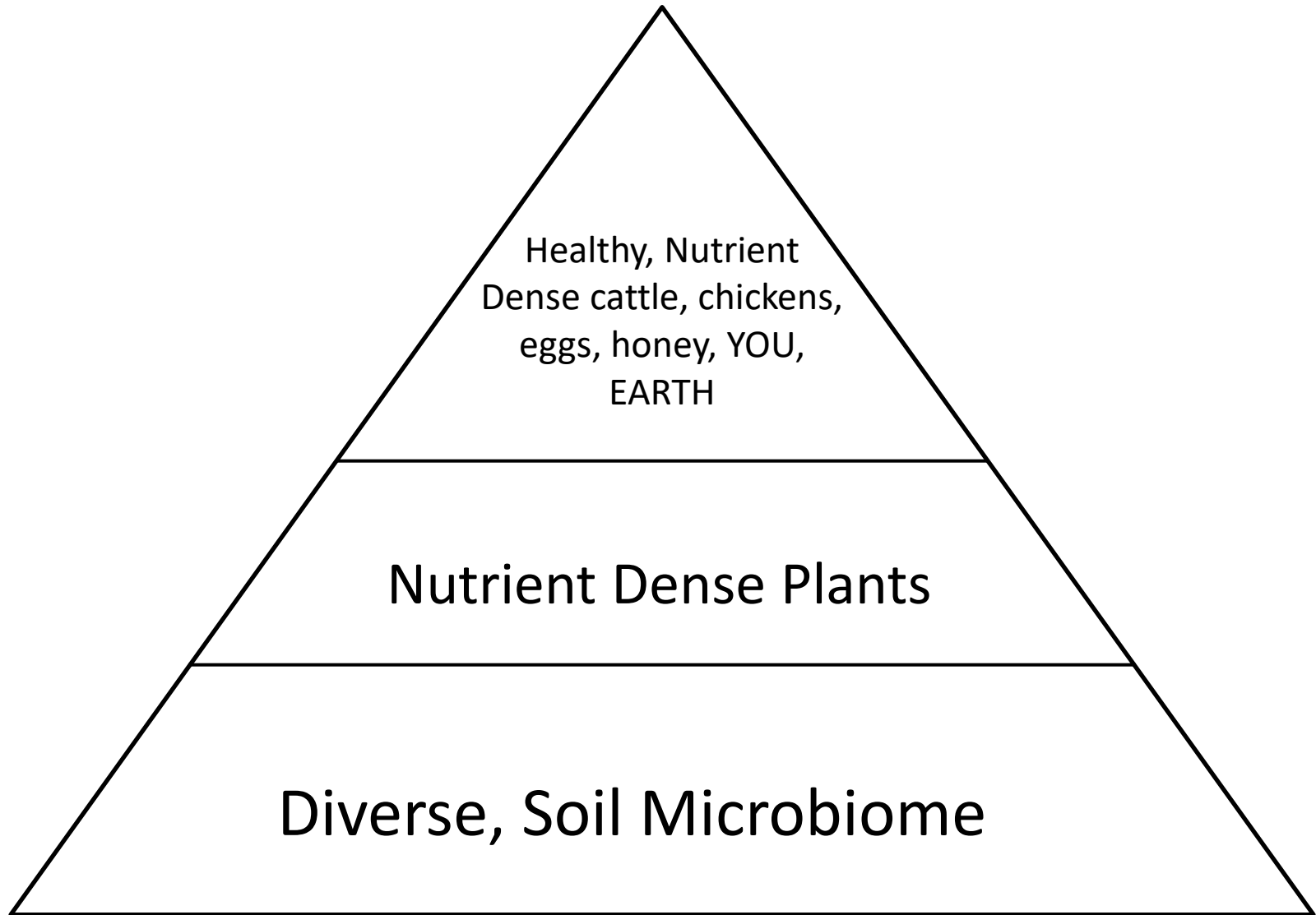
L = Low, M= Medium, H=High, V= Very High, S = Sufficient

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 ($\mu\text{g/g}$)	724.142
Bacterial Standard Deviation Biomass ($\mu\text{g/g}$)	87.835
Bacterial Standard Deviation as Percentage of Mean	12.10%
Actinobacterial Biomass ($\mu\text{g/g}$)	0.167
Actinobacterial Standard Deviation Biomass ($\mu\text{g/g}$)	0.16
Actinobacterial Standard Deviation as Percentage of Mean	95.90%
Fungal Biomass ($\mu\text{g/g}$)	851.77
Fungal Standard Deviation Biomass ($\mu\text{g/g}$)	882.451
Fungal Standard Deviation as Percentage of Mean	103.60%
Fungal Average Diameter - Weighted Mean (μm)	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 ($\mu\text{g/g}$)	0
Oomycetes Standard Deviation Biomass ($\mu\text{g/g}$)	0
Oomycete Standard Deviation as Percentage of Mean	0.00%
Oomycetes Average Diameter - Weighted Mean (μm)	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%



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!!!



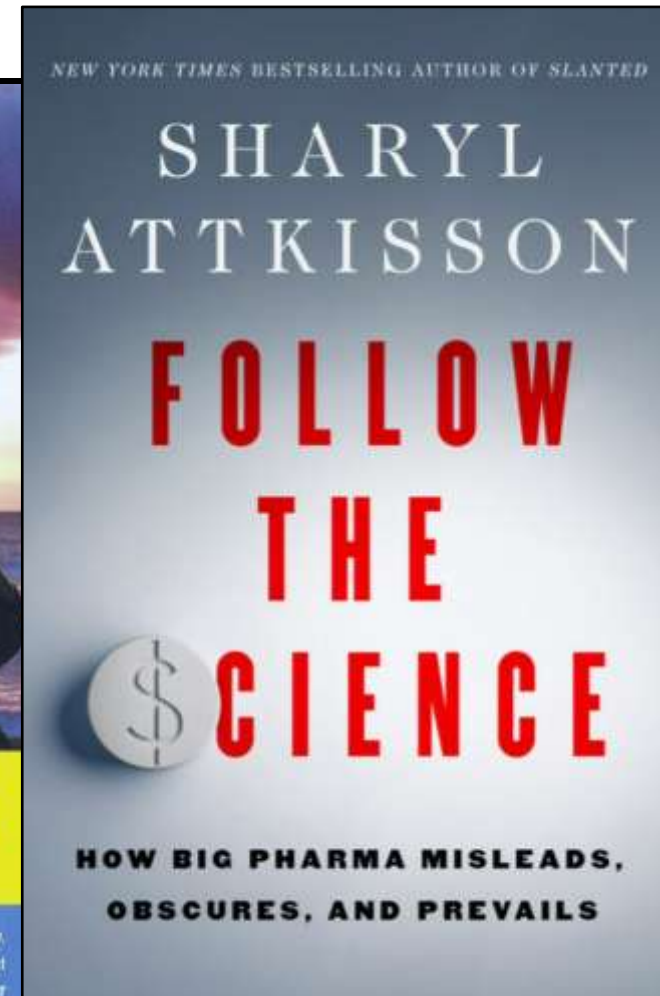
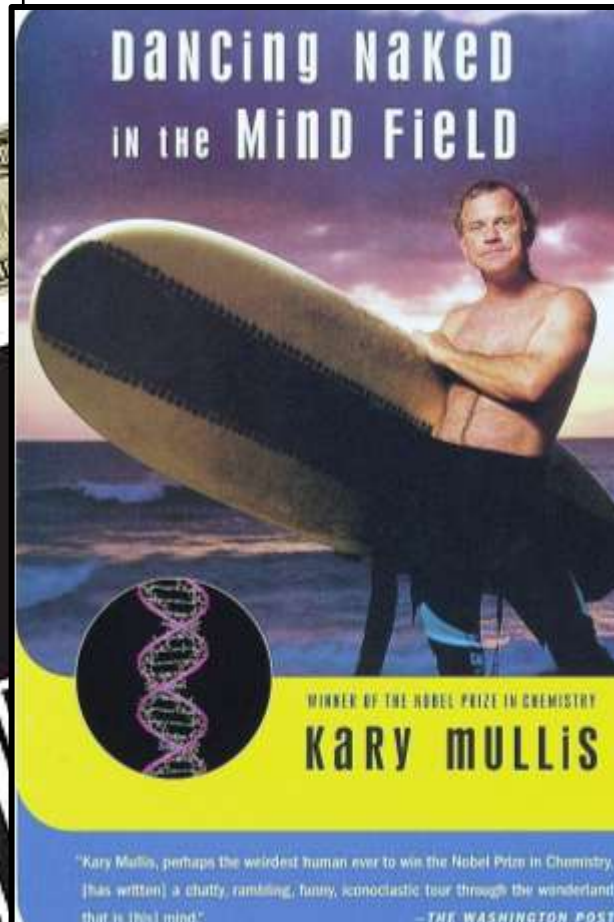
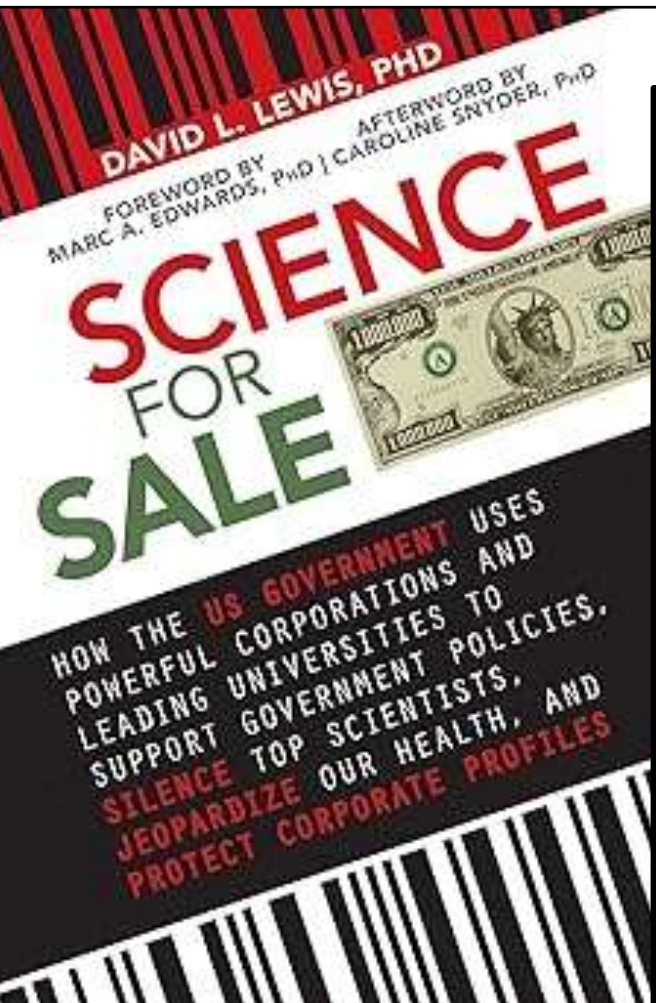
Follow the Science!

- Easy for “Physical” Science



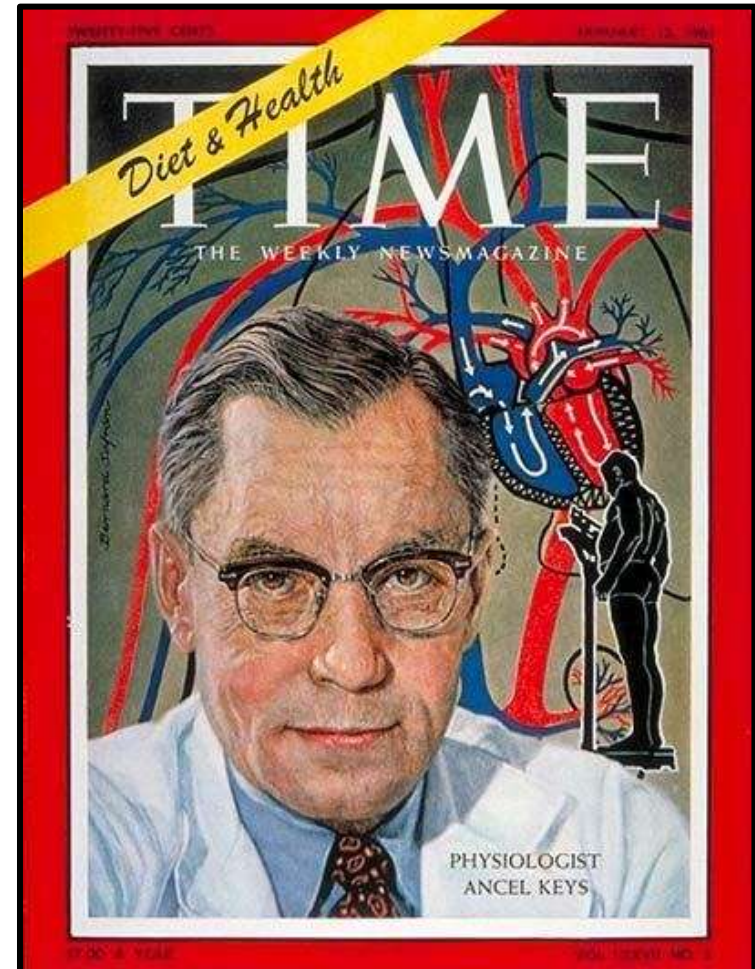
Follow the Science—Ha!!

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

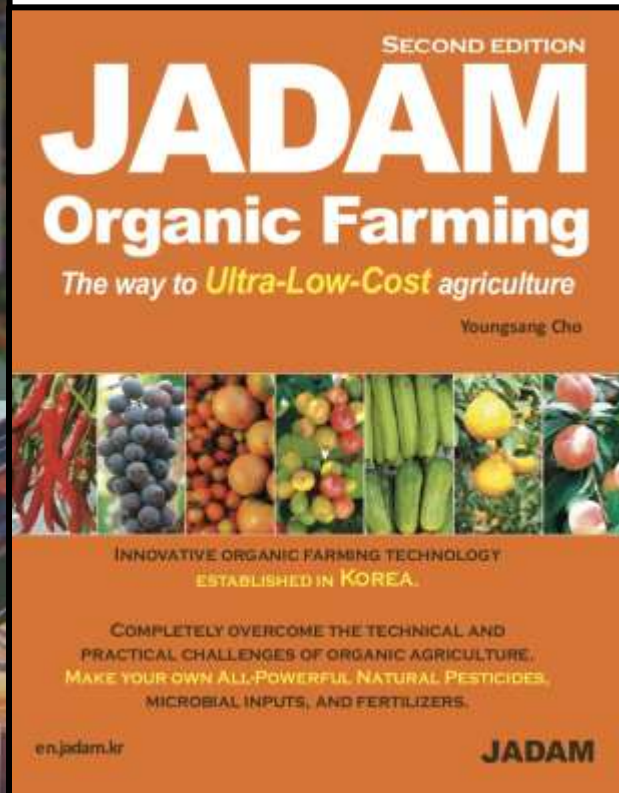
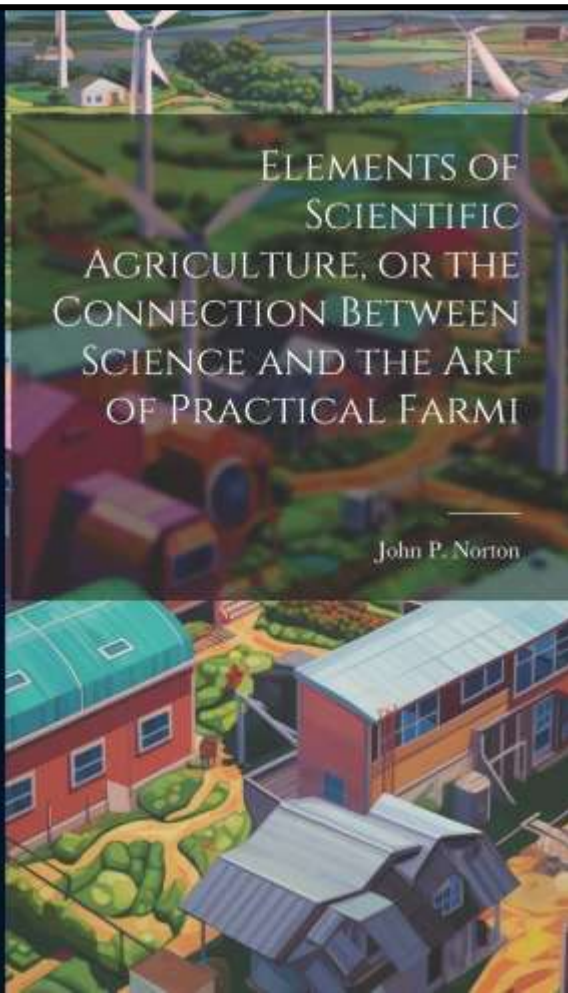
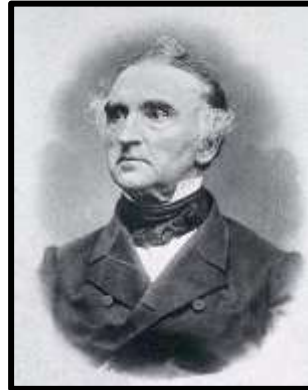


Hmmm—"No Fat/Low Fat"

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

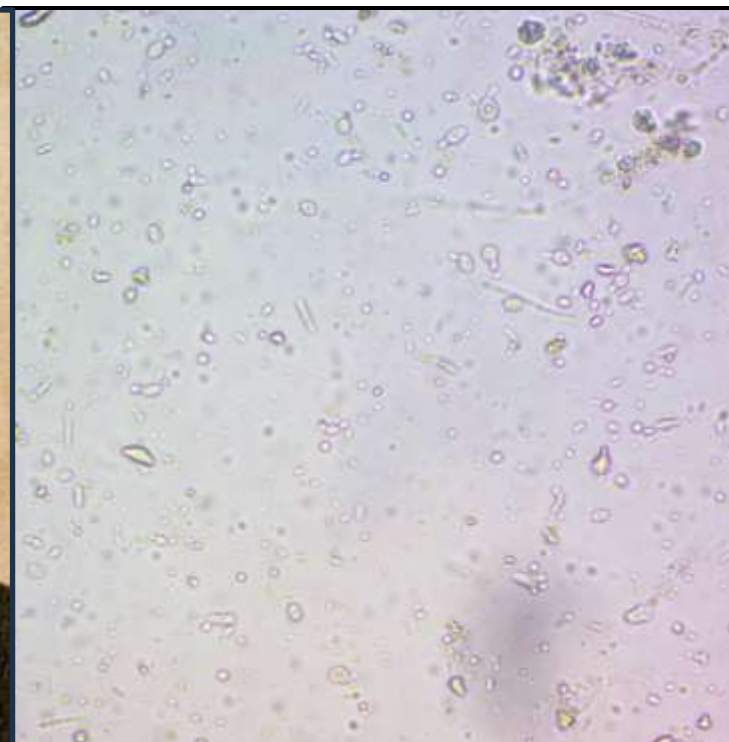
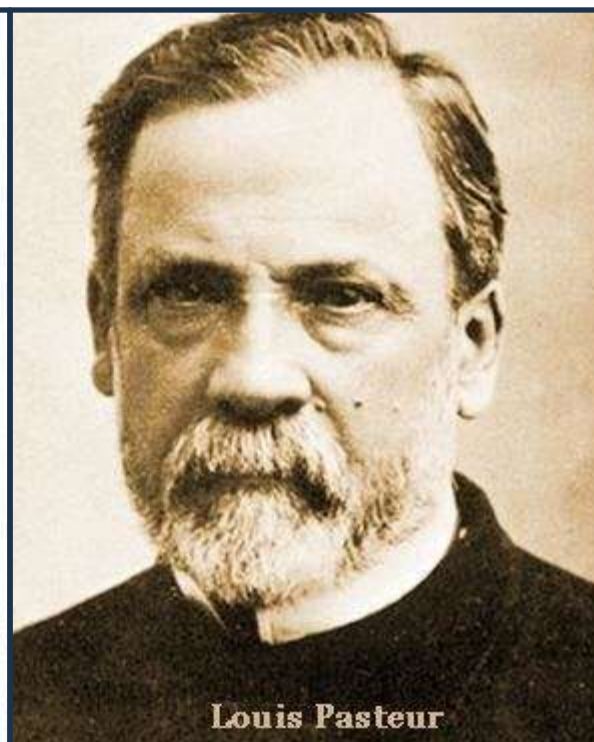
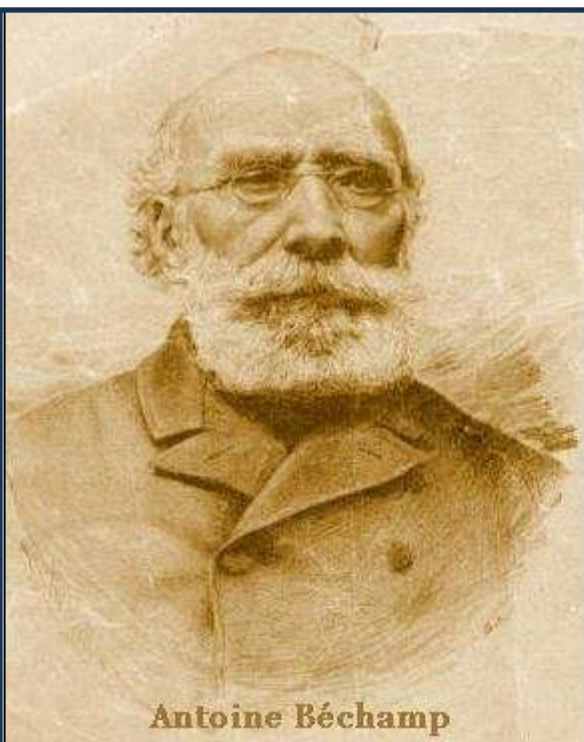


Hmmm—"N-P-K Fertilizer"



Hmmm—"Germs"

- Dr Louis Pasteur—"Germ Theory"



Hmmm—"Diseases"

the **MOTH** in the **IRON LUNG**

A
Biograph
of Polio



Forrest Maready
Author of *Crooked: Man-Made Disease Explained*

CAN YOU CATCH A **COLD?**



Untold History &
Human Experiments

DANIEL ROYTAS
Foreword by Dr Samantha Bailey

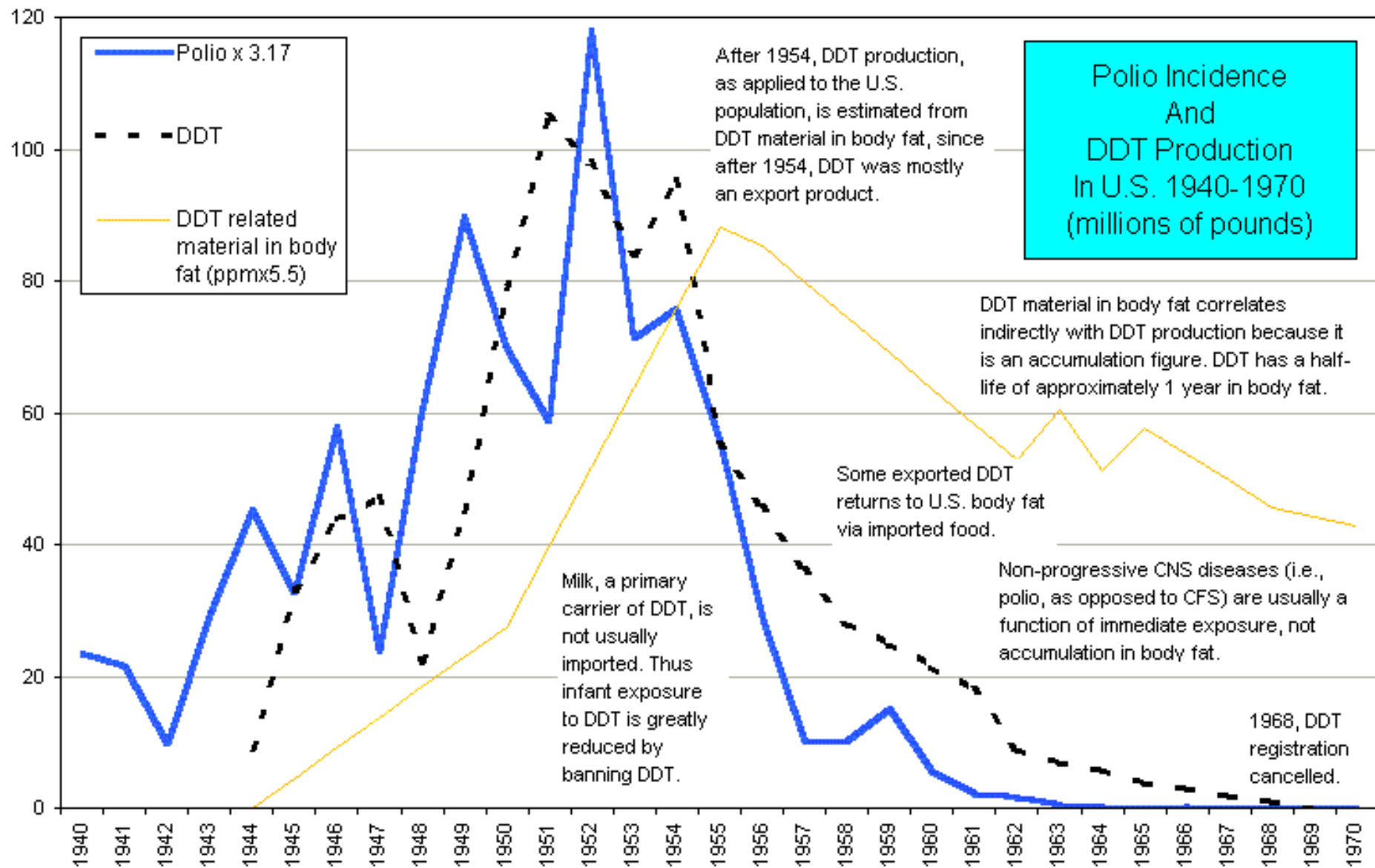
TURTLES ALL THE WAY DOWN

Vaccine Science and Myth



FOREWORD BY MARY HOLLAND, J.D.
EDITED BY ZOIE O'TOOLE AND MARY HOLLAND

Polio vs DDT

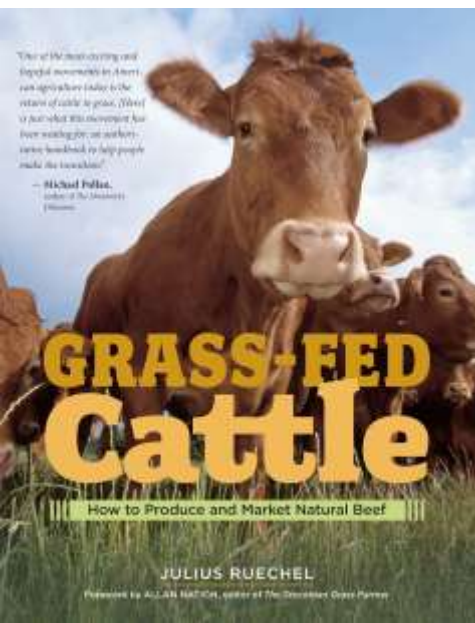
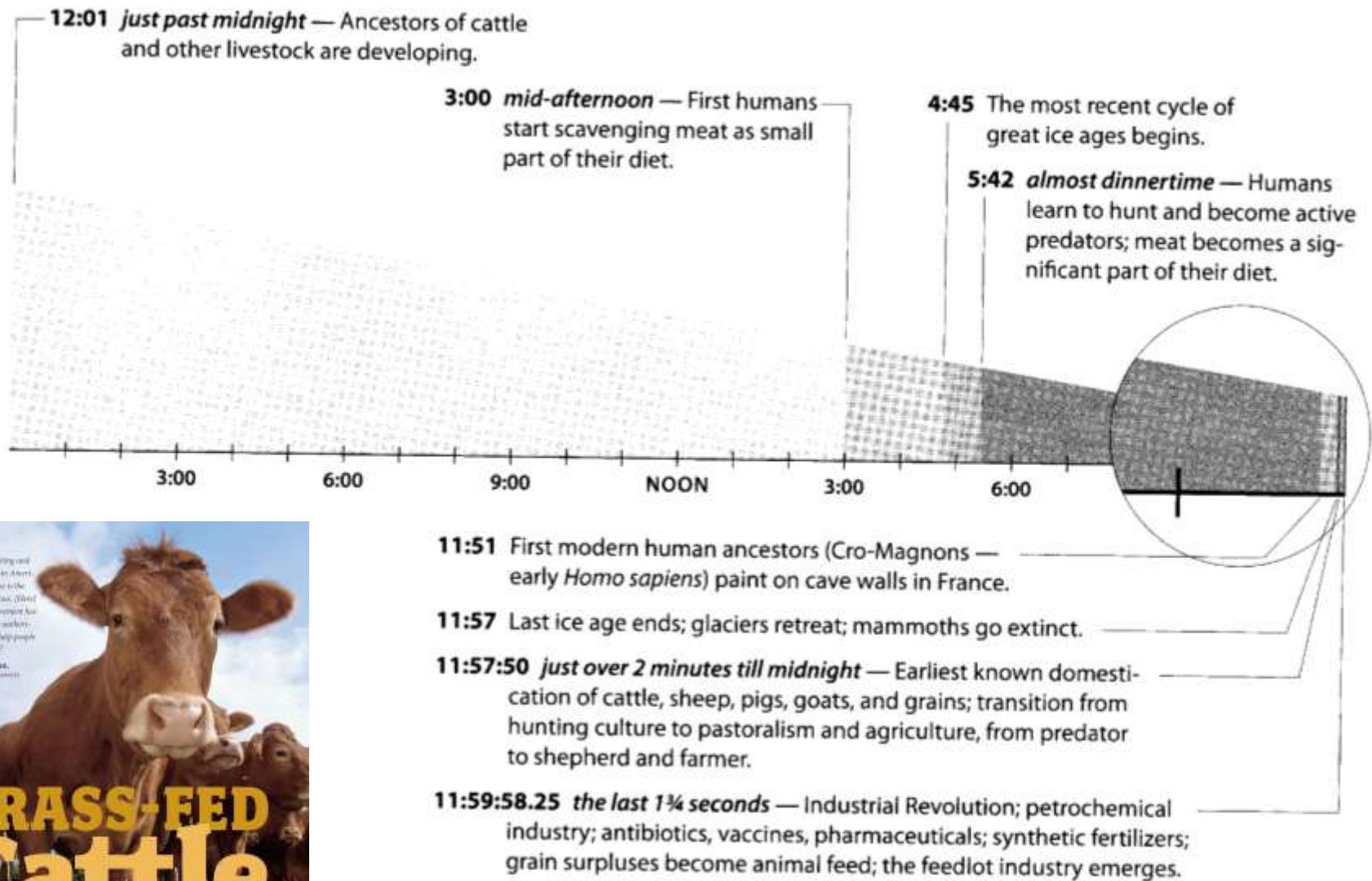


Your Office is “Nature”

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

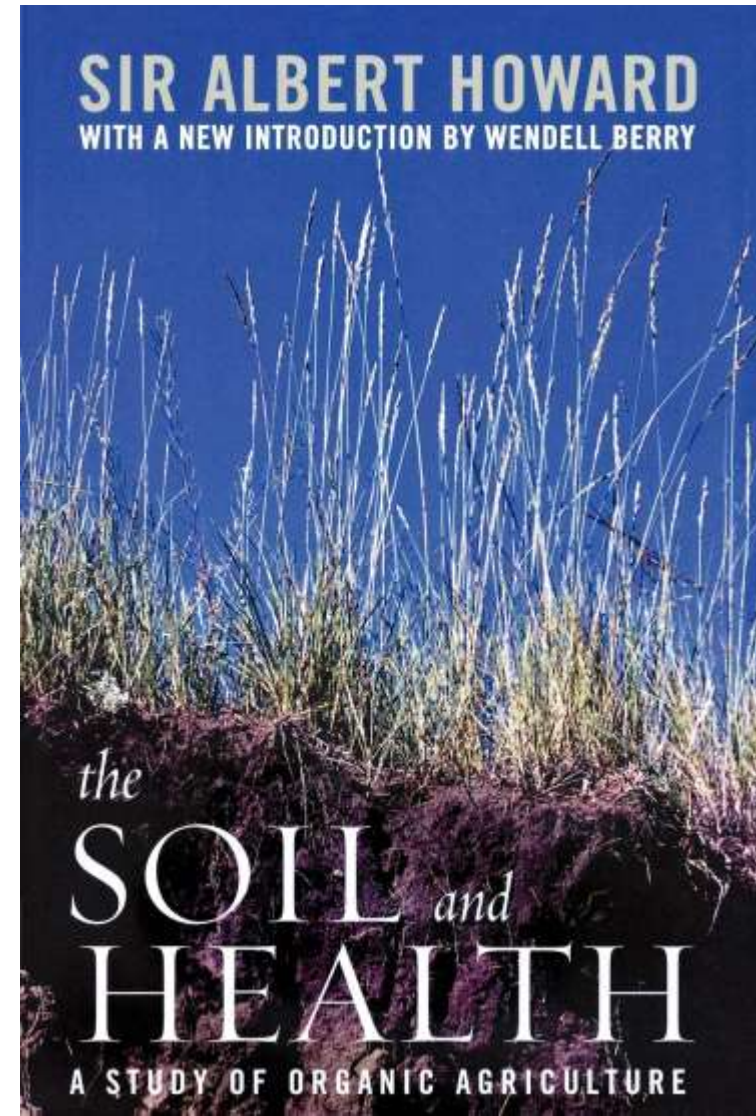


THE HISTORY OF MODERN LIVESTOCK COMPRESSED INTO 24 HOURS



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 °Brix

	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

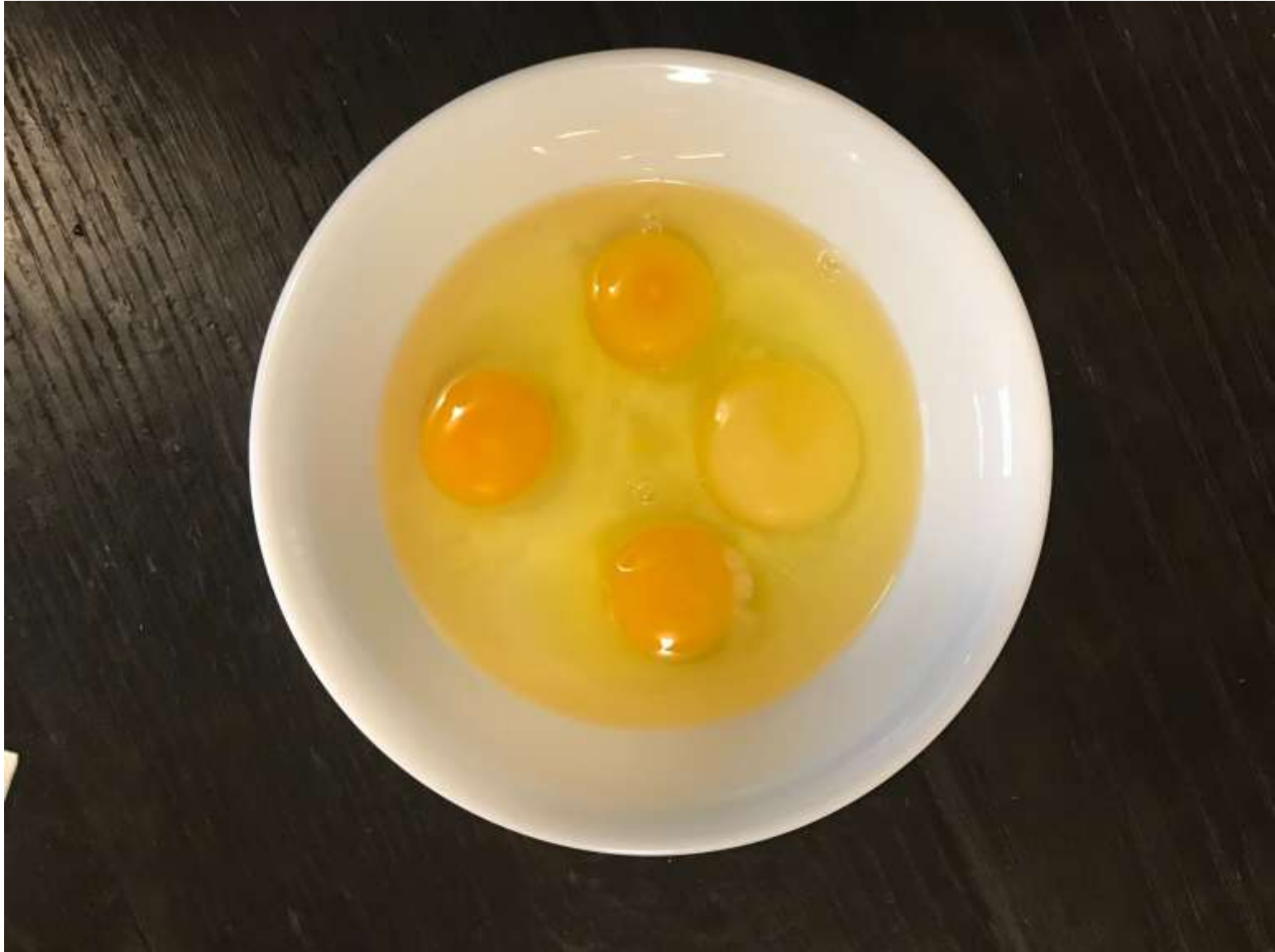
Within a given species of plant, the crop with the higher refractive index will have a higher sugar content, higher mineral content, higher protein content and a greater specific gravity or density. This adds up to a sweeter tasting, more minerally nutritious food with lower nitrate and water content,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

	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



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 Mandarinine 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 Mandarinine 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



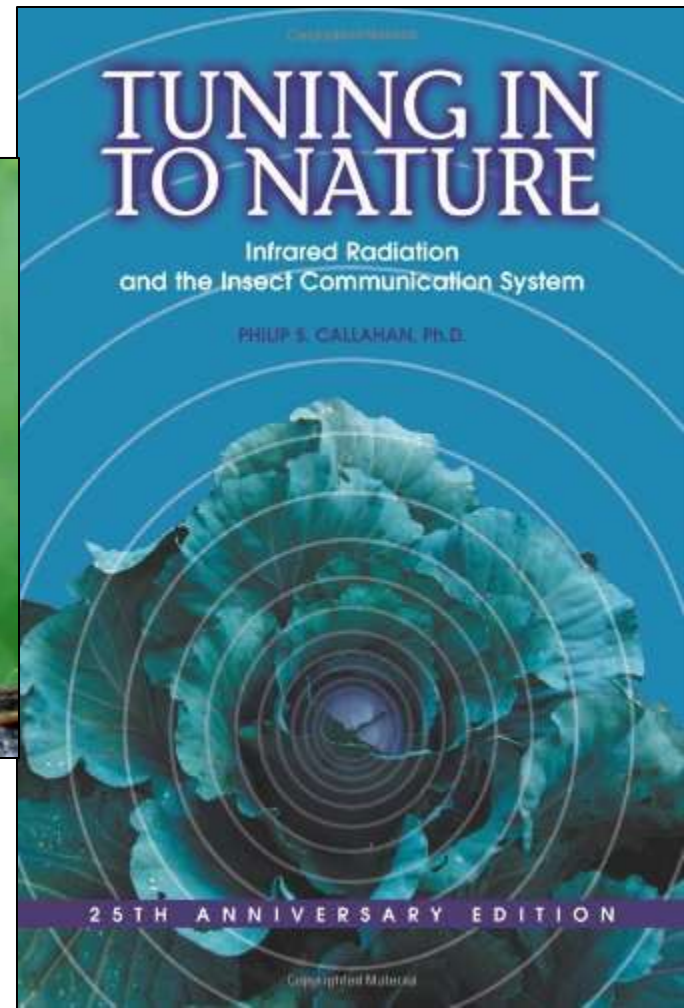
Soil to Grass to Beef to Me





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”

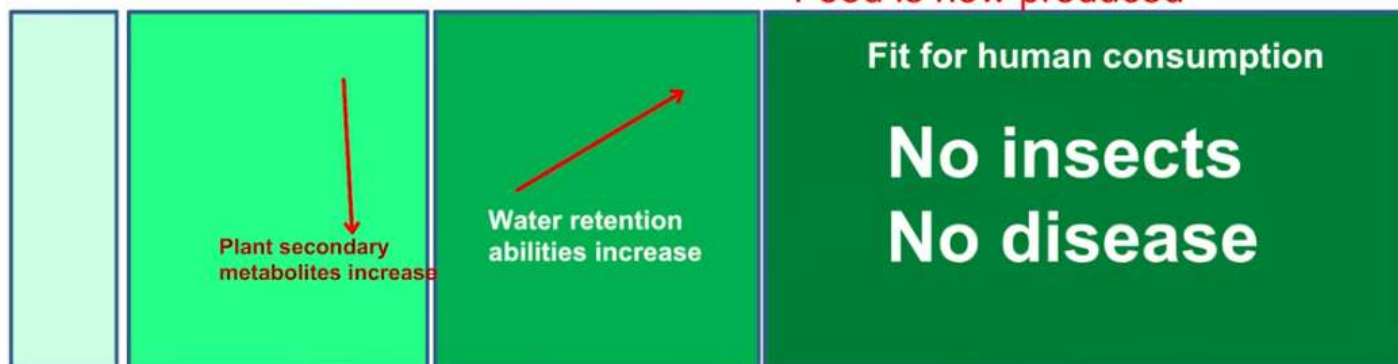


Leaf Brix chart: generalized markers

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20+

Insect resistance begins

Food is now produced



At what Brix levels do various insects lose interest in plants?



Aphid group

6-8 Brix

Sucking insects

7-9 Brix

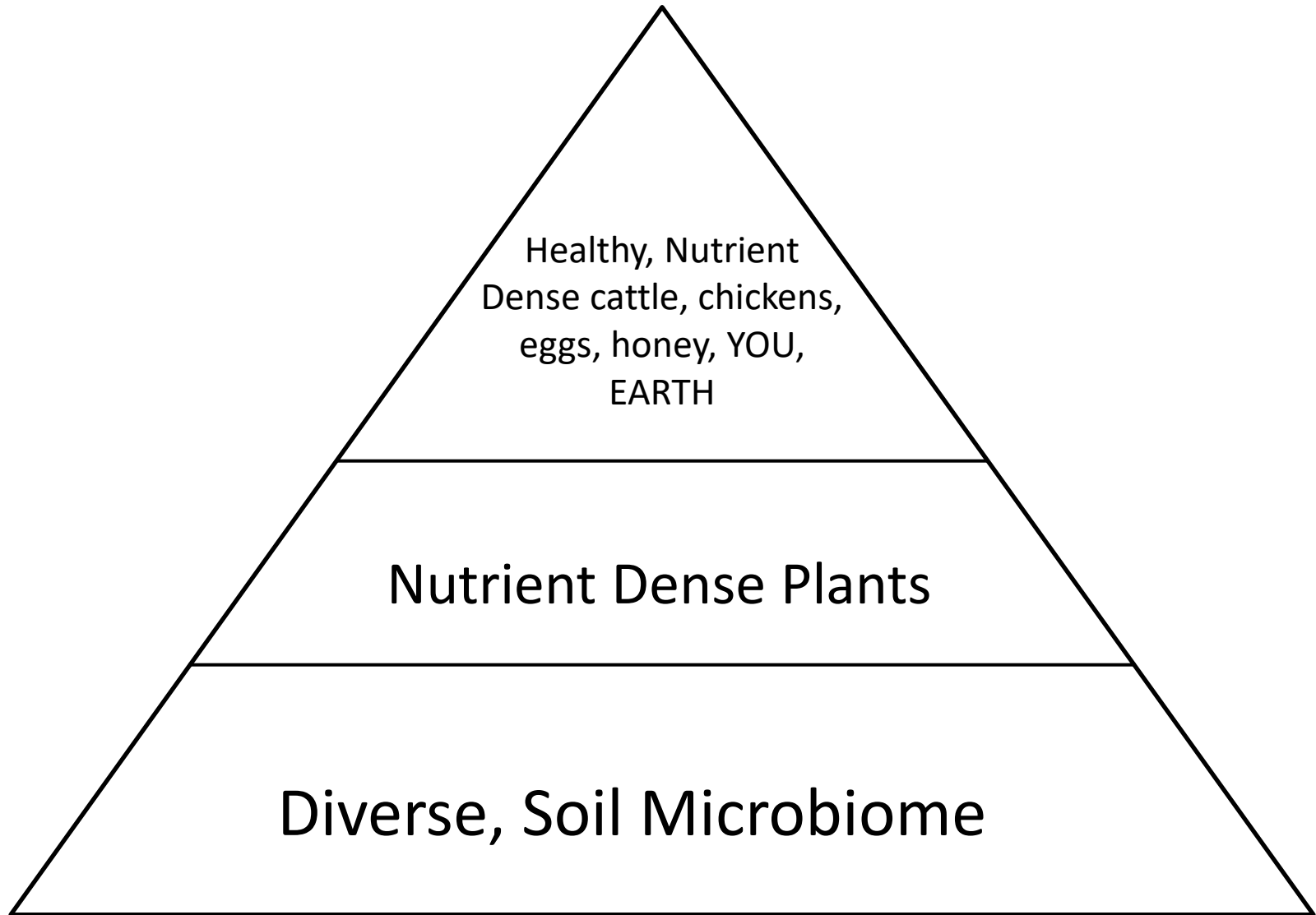
Chewing Insects

9-11 Brix

Grasshopper group

10-12+ Brix

The Foundation--Microbiome

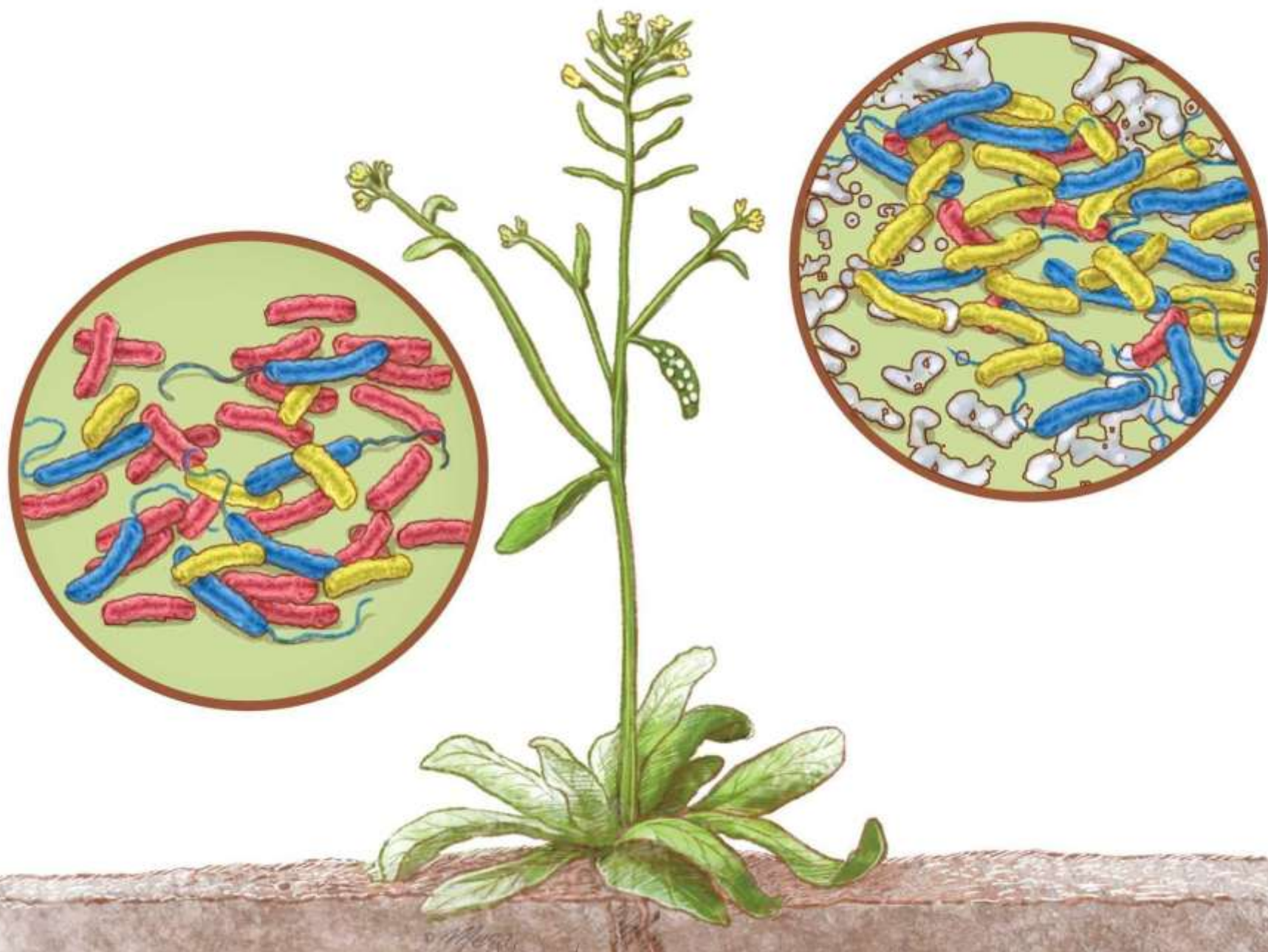


Team Effort!

- 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

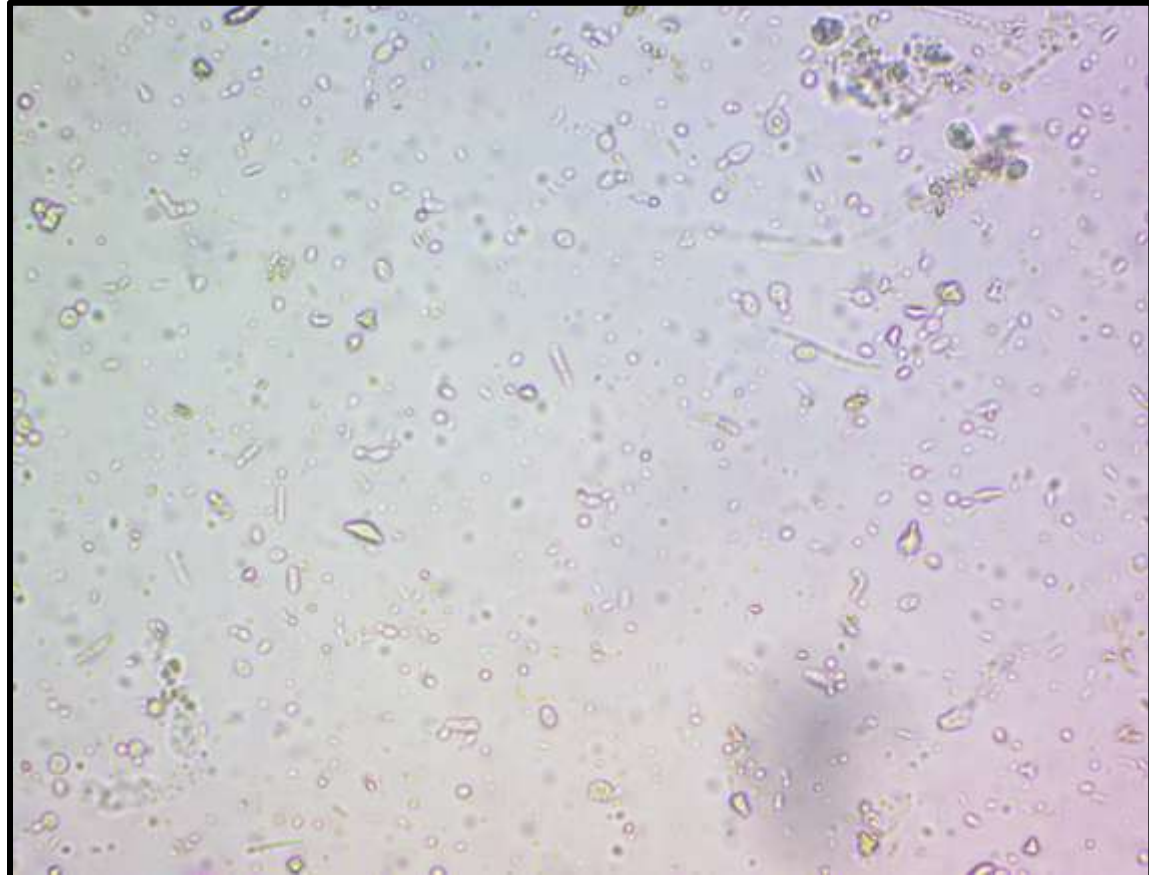
What's In This Stuff??





Bacteria

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





Fungi

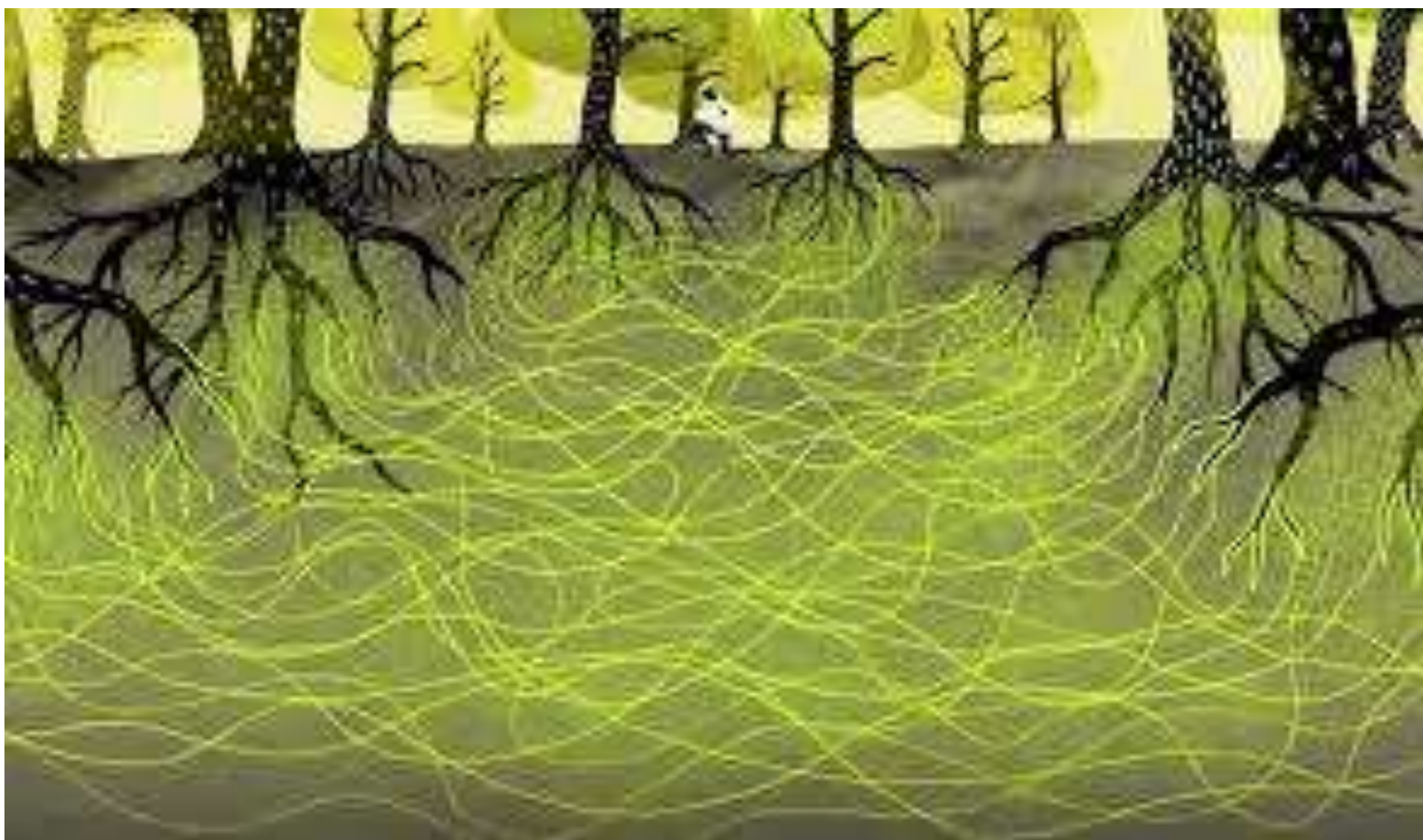
- Recycle more complex organic matter
 - Wood chips, leaves, straw, etc (woody, high Carbon)







Photo Source: Israel Chemicals Limited Growing Solutions



Protozoa--Predator



Nematodes--Predator



There's So Much More!

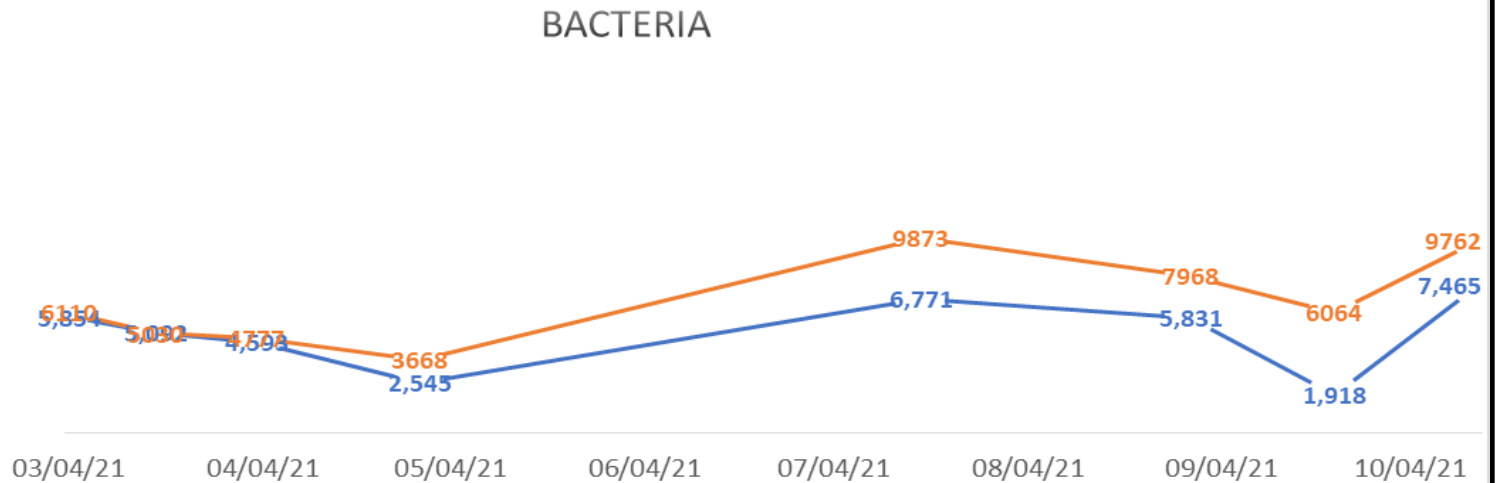
- 3.5-4.5 tons Bacteria/acre
- Reproduce 6-10x/season
- Team Bacteria/Fungi/Algae
 - Auxins (Growth Hormones)
 - Alpha & Beta Carotenes
 - Vitamins B_{1,2,3,6,7,9,12}, C/D/K
 - Enzymes
 - Amino Acids
 - Antibiotics
 - **Need Diversity & Balance!!!!**



SOIL
MICROORGANISMS
AND HIGHER PLANTS
N. A. Krasil'nikov



Pasture Testing Bacteria



Bacteria 9762 ppm \approx 20,000 lbs/acre \approx 10 tons/acre

— T Bacteria (µg/g) — C Bacteria (µg/g)

Chemistry

Periodic Table of the Elements

The periodic table is color-coded by groups and periods. The legend indicates the following categories:

- State of matter (color of box):**
 - Solid (dark blue)
 - Liquid (light blue)
 - Gas (yellow)
 - Unknown (grey)
- Category in the periodic table (color of background):**
 - Alkali metal (red)
 - Alkaline earth metal (orange)
 - Transition metal (blue)
 - Post-transition metal (light green)
 - Nonmetal (yellow)
 - Halogen (dark green)
 - Noble gas (pink)

The table includes the following elements:

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
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

The lanthanide and actinide series are shown below the main table:

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

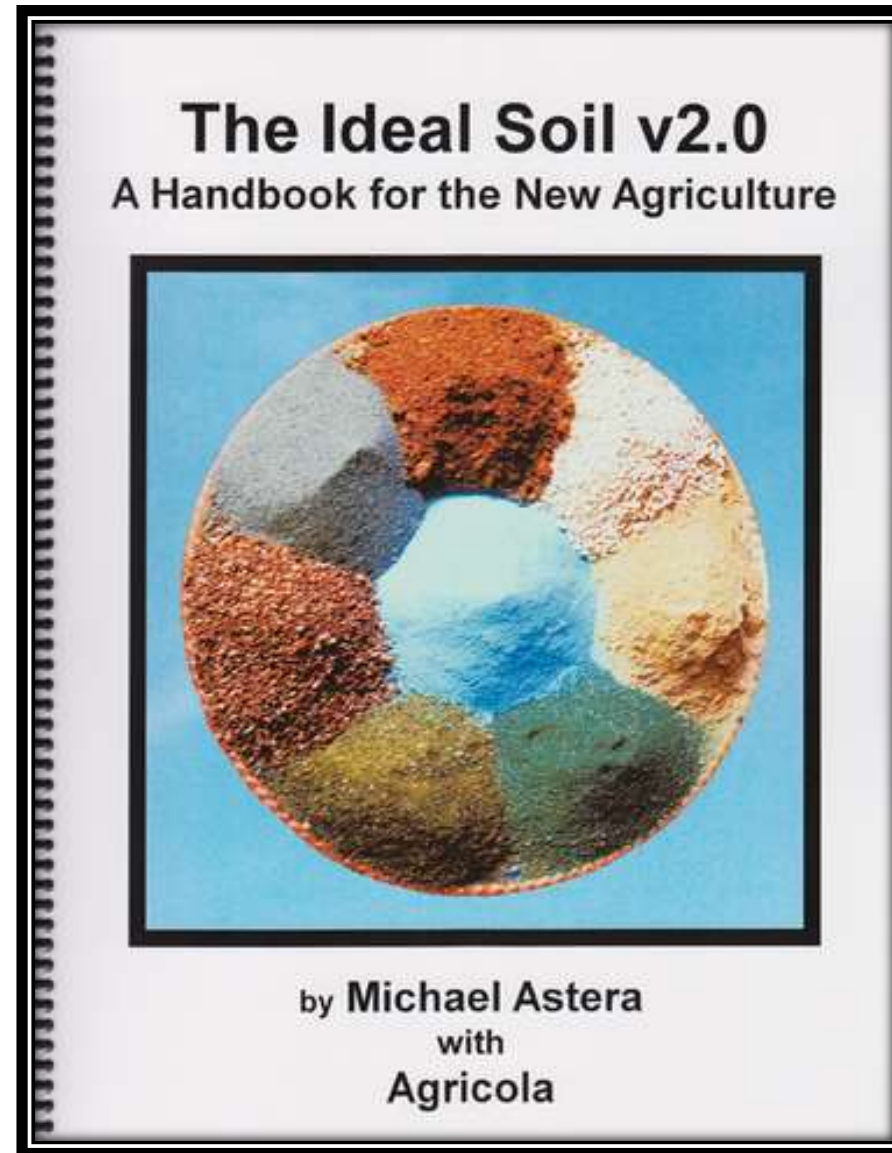
Dr William Albrecht



University of Missouri

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 (P₂O₅) should be ~2X potash (K₂O)	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⁺ 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⁺ 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.	

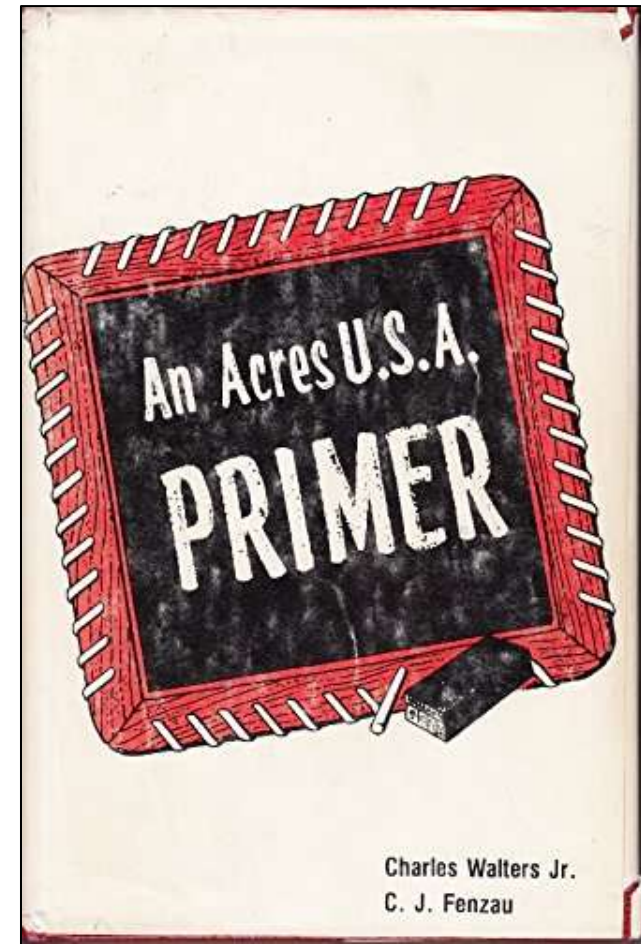
Micro (trace) Elements

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

<i>Additional tests, if they were requested</i>											
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





PHONE 507-235-6909 FAX 507-235-9155 P.O. BOX 788 FAIRMONT, MN 56031

Morgan (pH 4.8)

NAME:	Kevin Krause	DATE:	02/12/24
ADDRESS:	4447 Dry Fork Road	SAMPLE TESTED:	TA1 Bottom Bio/Clean
CITY/STATE:	Hampshire, TN 38461	Plot Size:	1 Acre Sq. Ft.
		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	Soil Index
HUMUS			30-40	3	
NITRATES	lbs. / Acre		40	8	
AMMONIA	lbs. / Acre		40	6	
PHOSPHORUS	lbs. / Acre	1P:1K	174	7	0.03 : 1 P to K Ratio
POTASSIUM	lbs. / Acre		167	214	
CALCIUM	lbs. / Acre	7 Ca : 1 Mg	3000	1104	16.24 : 1 Ca to Mg Ratio
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	

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 ₂ O ₅	K as K ₂ O	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 ₂ O ₅	K as K ₂ O	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

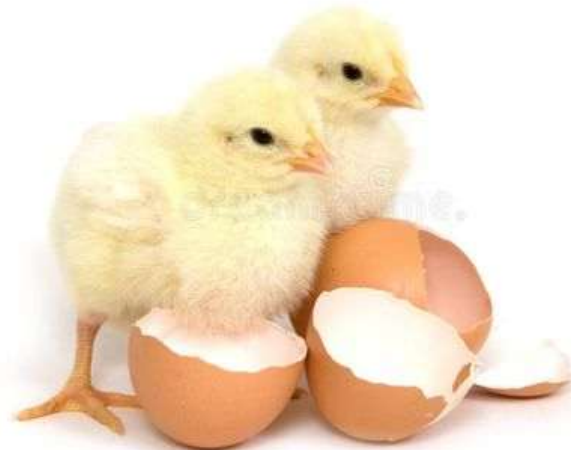
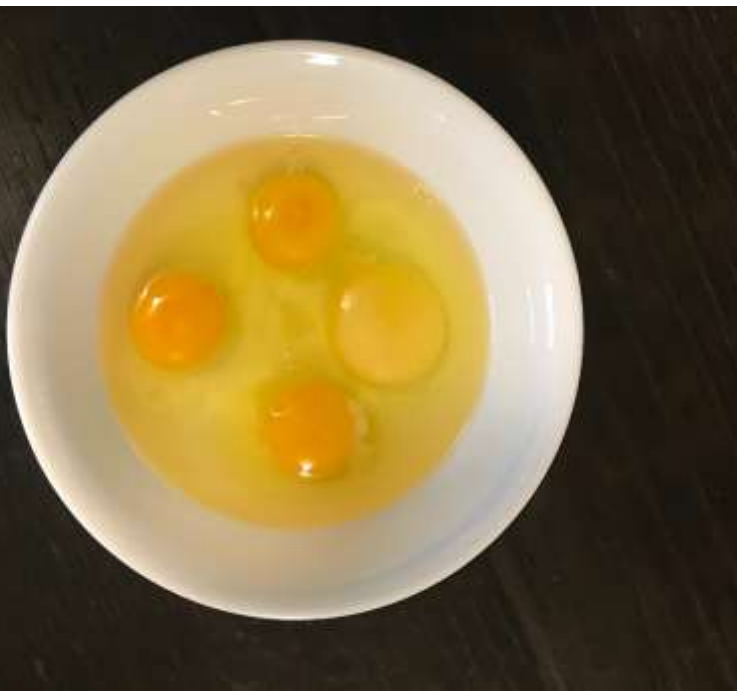
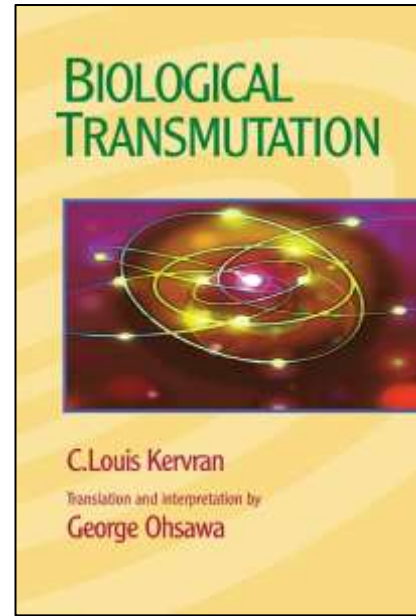
Purified Source	Sulfur S	Boron B	Iron Fe	Mang. Mn	Copper Cu	Zinc Zn
Ag Sulfur	90-100					
Borax**		9				
Solubor TM **		20.5				
Fe sulfate 1H ₂ O	18		30			
Fe sulfate 7H ₂ O**	11.5		20			
Mn sulfate 1H ₂ O*	19			32		
Cu sulfate 5H ₂ O**	12.5				25	
Zinc sulfate 1H ₂ O*	17					35
Zinc sulfate 7H ₂ O**	11					22

**Highly soluble in H₂O

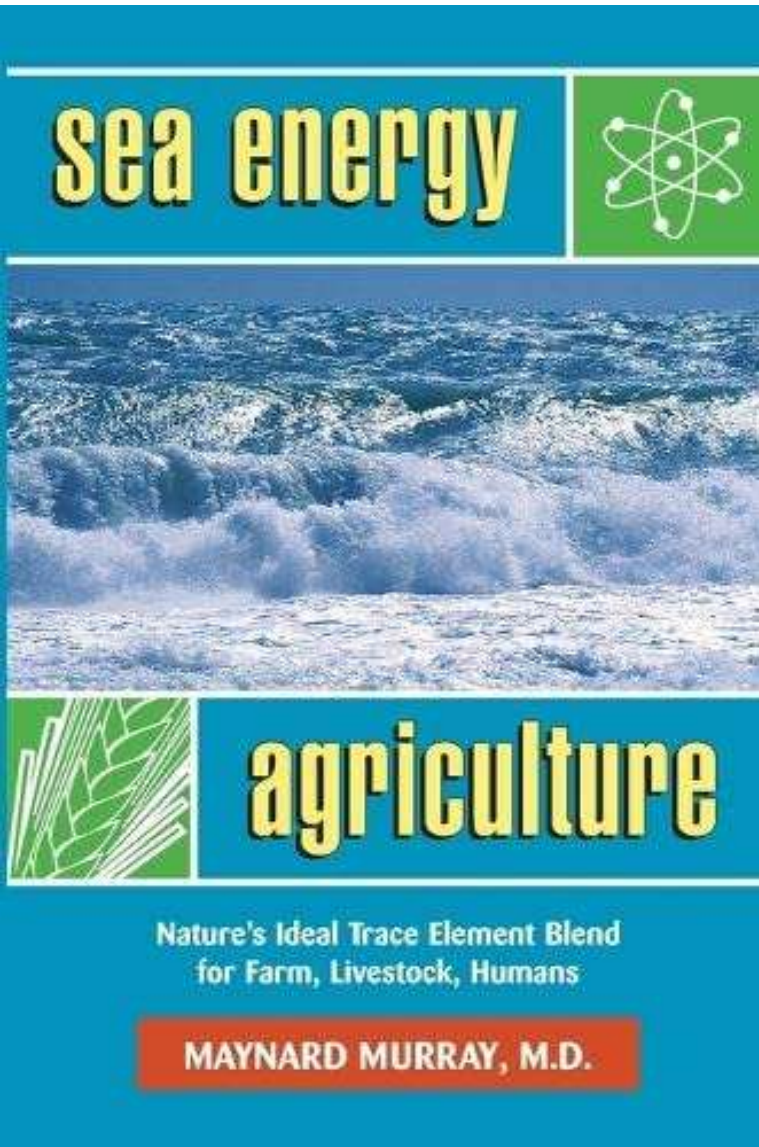
*Varies in solubility in H₂O

Biological Transmutation?

- Silicon to Calcium???



Sea Water Minerals

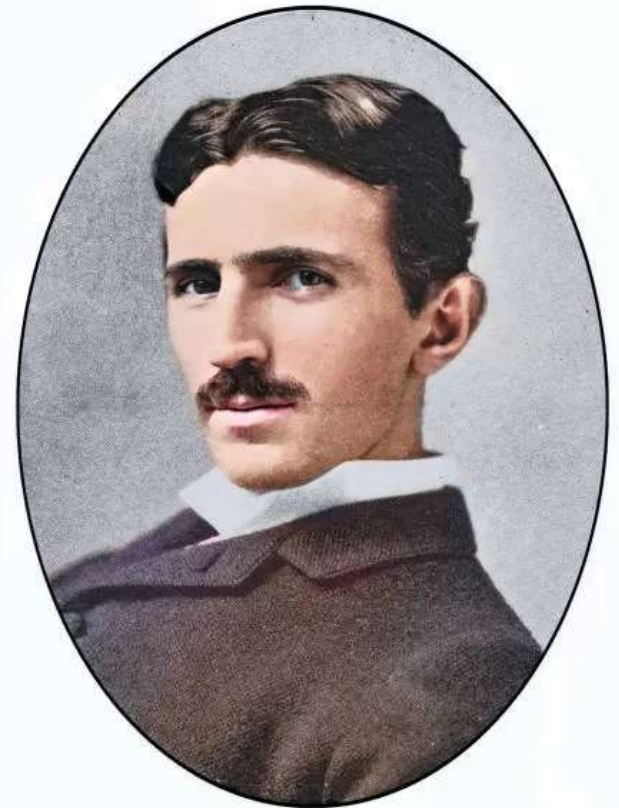


- Redmond or Sea 90
- 200-2200 lbs/acre
- HighBrixGardens.com
 - 43 lbs/acre
 - 43 oz/acre (water)

Physics

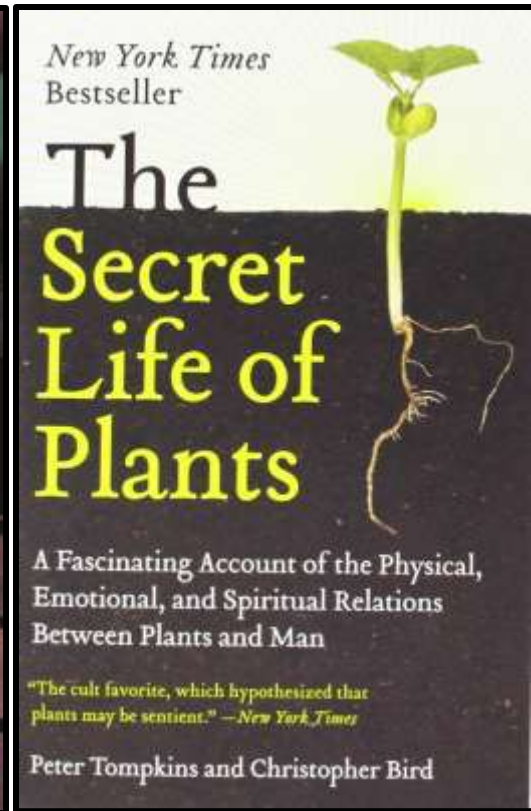
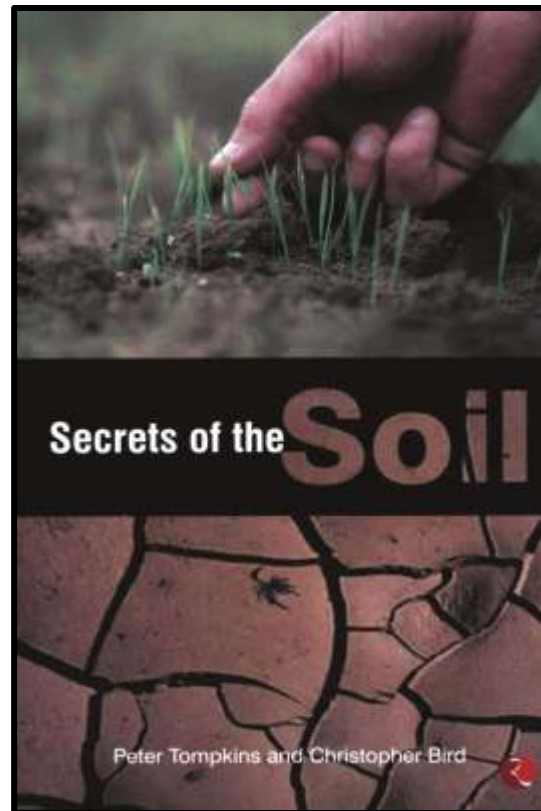
“If you want to find the secrets of the universe, think in terms of energy, frequency, and vibration.”

Nikola Tesla

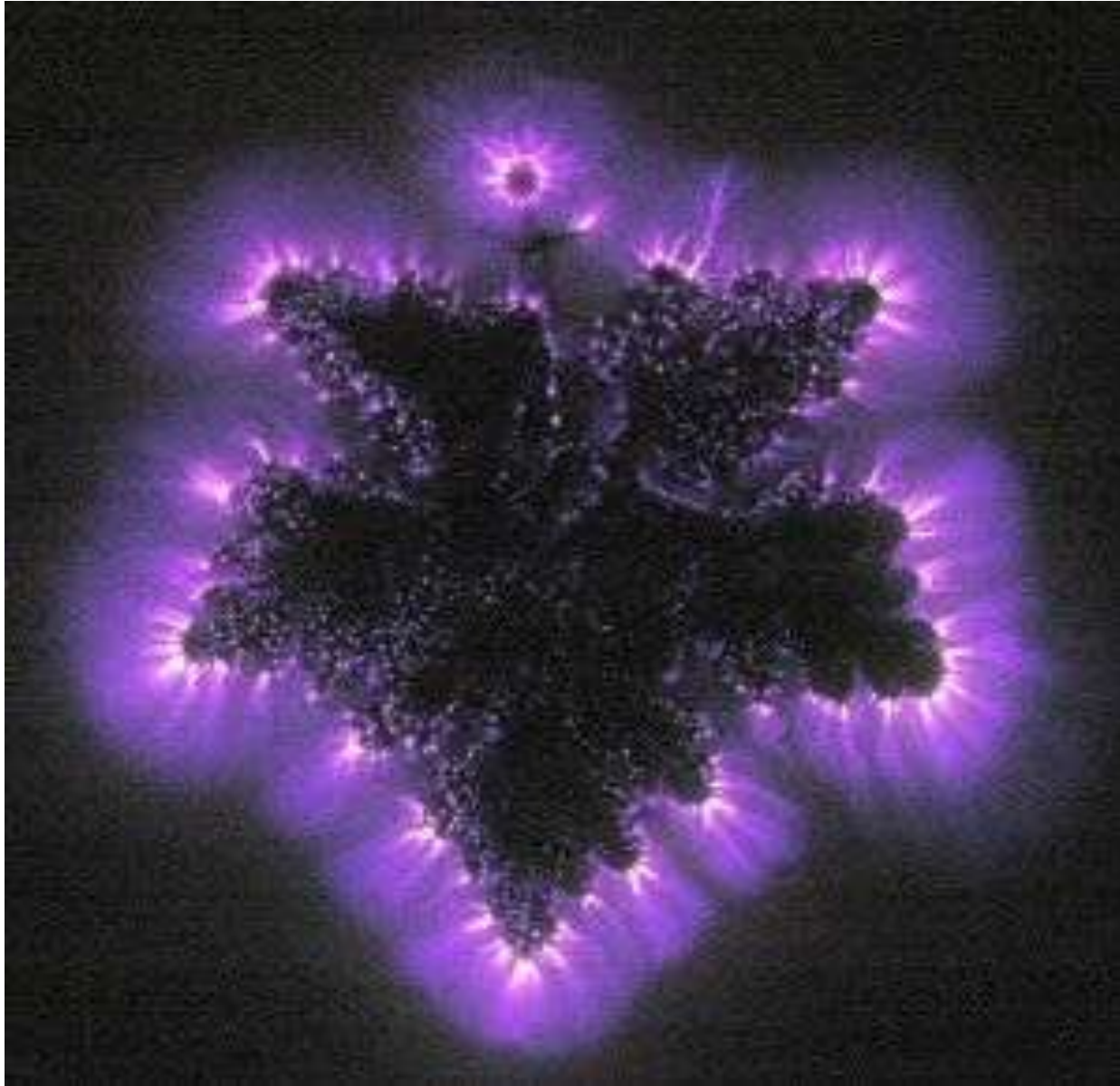


Physics

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



“Kirlian” Leaf Photo



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THE ORIGINAL FARMER'S ALMANAC

"USEFUL, WITH A PLEASANT DEGREE OF HUMOR"

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234

THE
OLD
FARMER'S
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ALMANAC

ROBERT B. THOMAS

FOUNDED IN
1792

WEATHER FORECASTS
FOR 18 REGIONS OF THE UNITED STATES

SUN, MOON, STARS, AND PLANETS

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

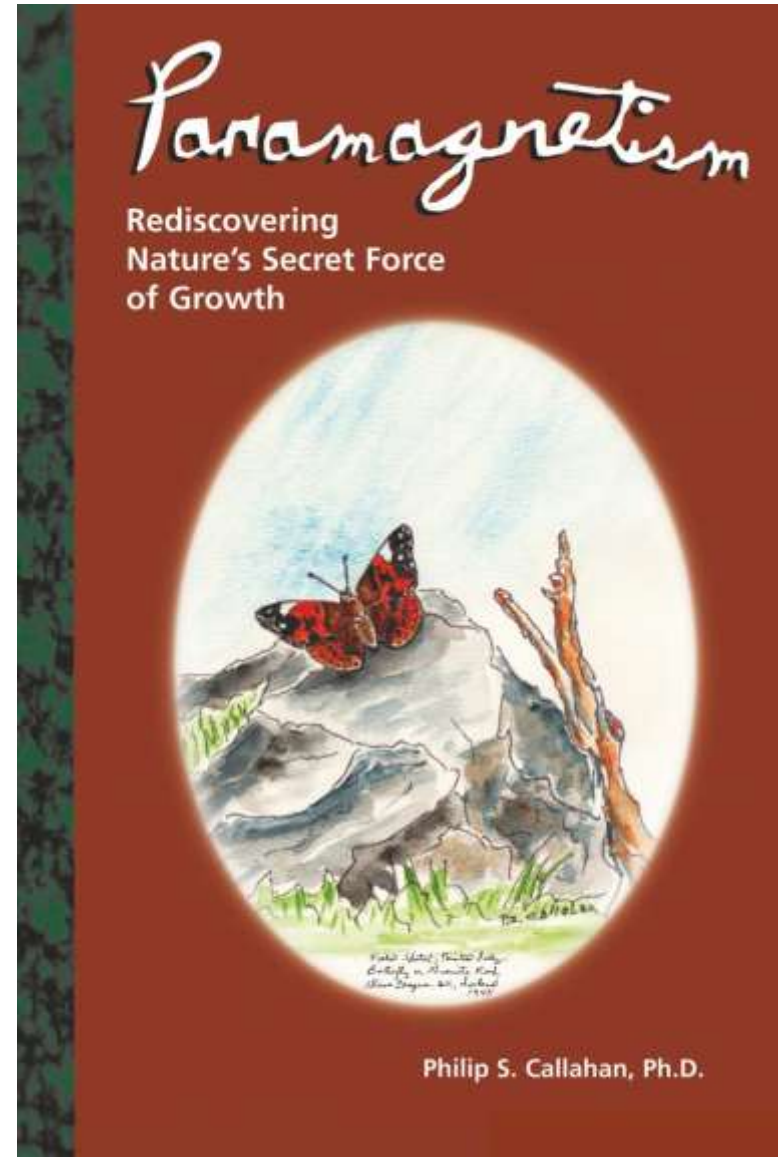


Tree Roots to Magnetic North



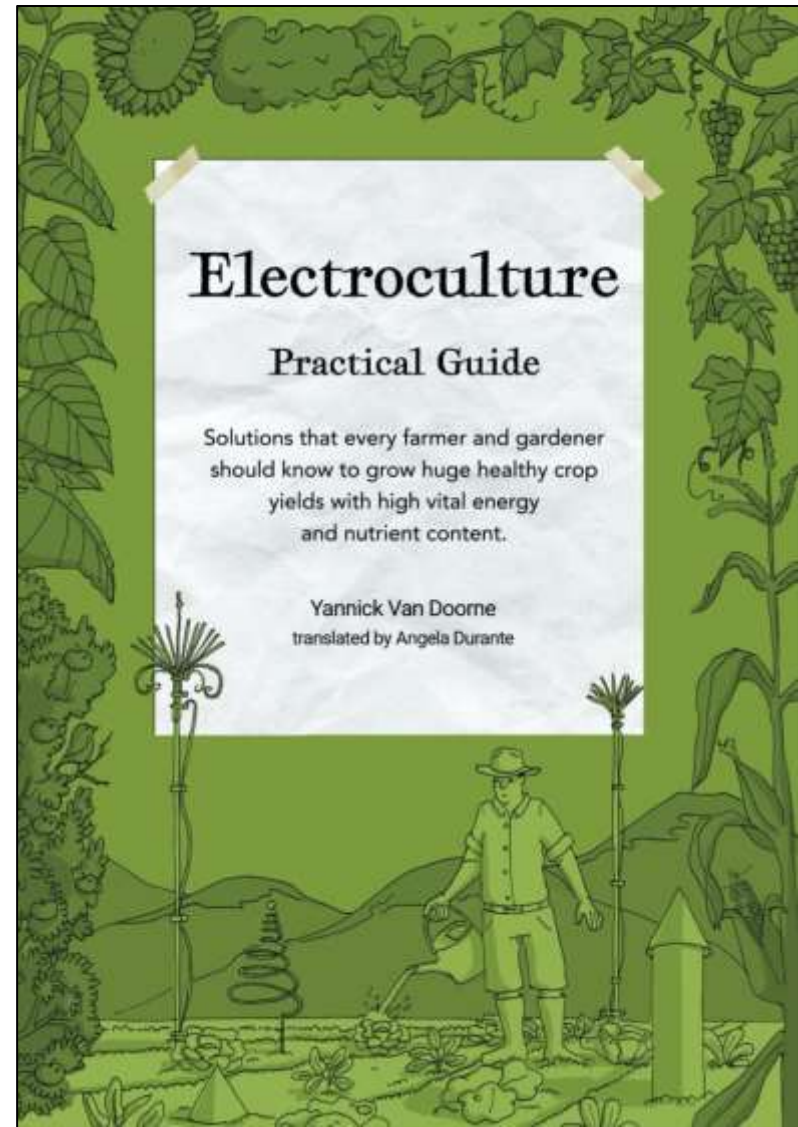
Paramagnetism

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



Electroculture

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





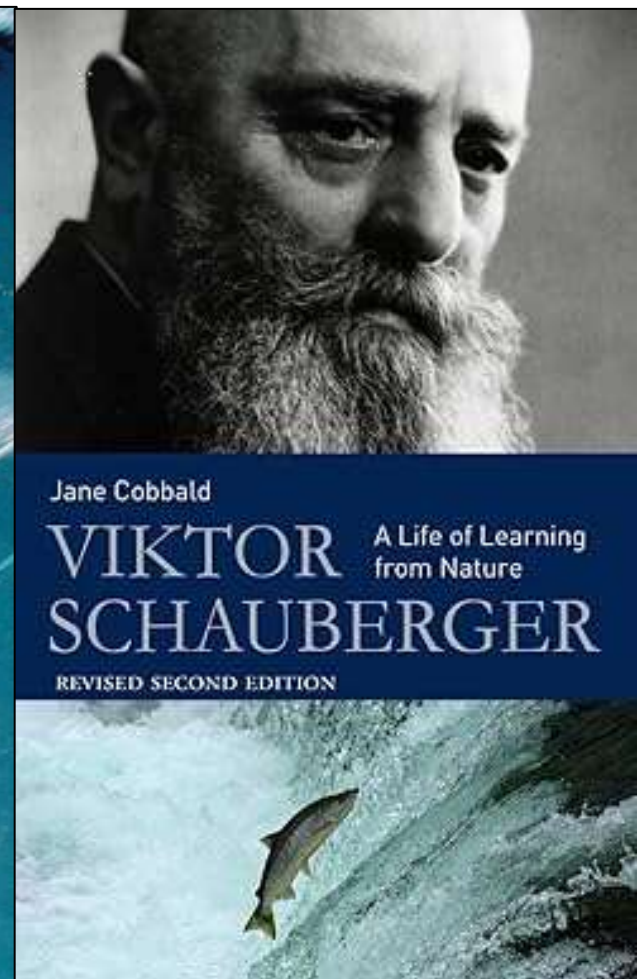
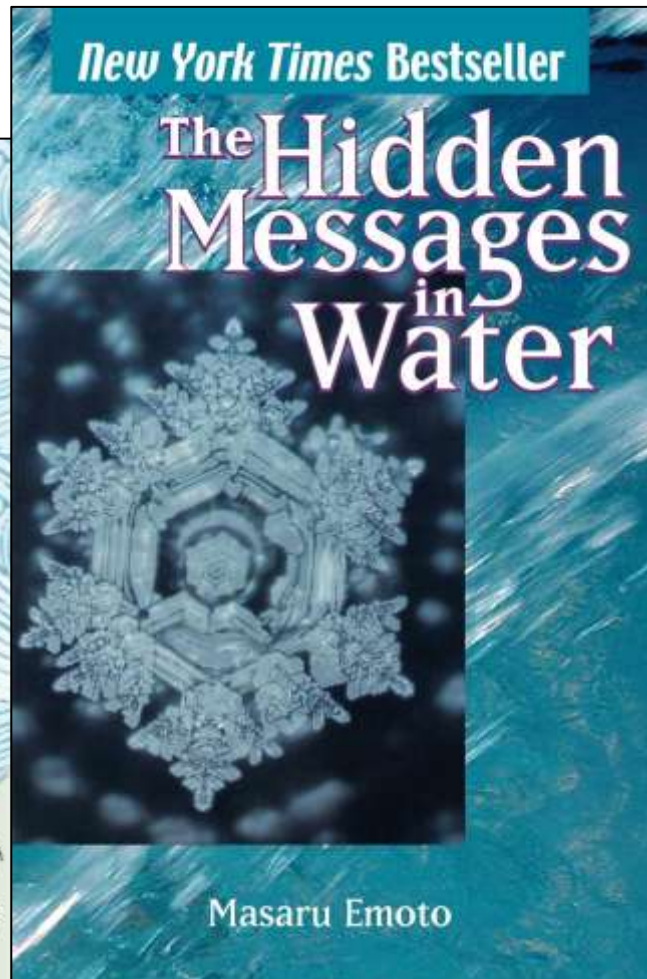
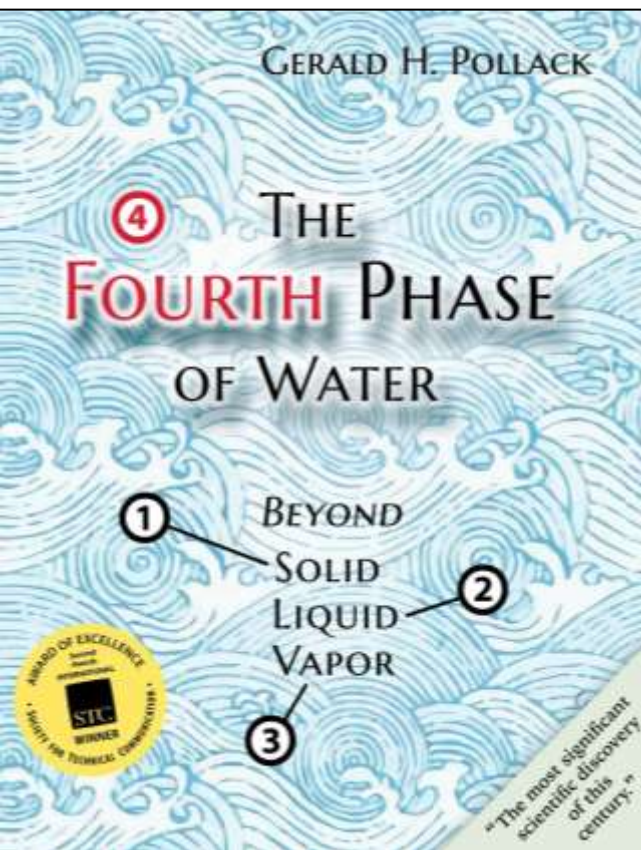


Homeopathy-1796

- Samuel Hahnemann, German Physician
- Dilutions of medicines

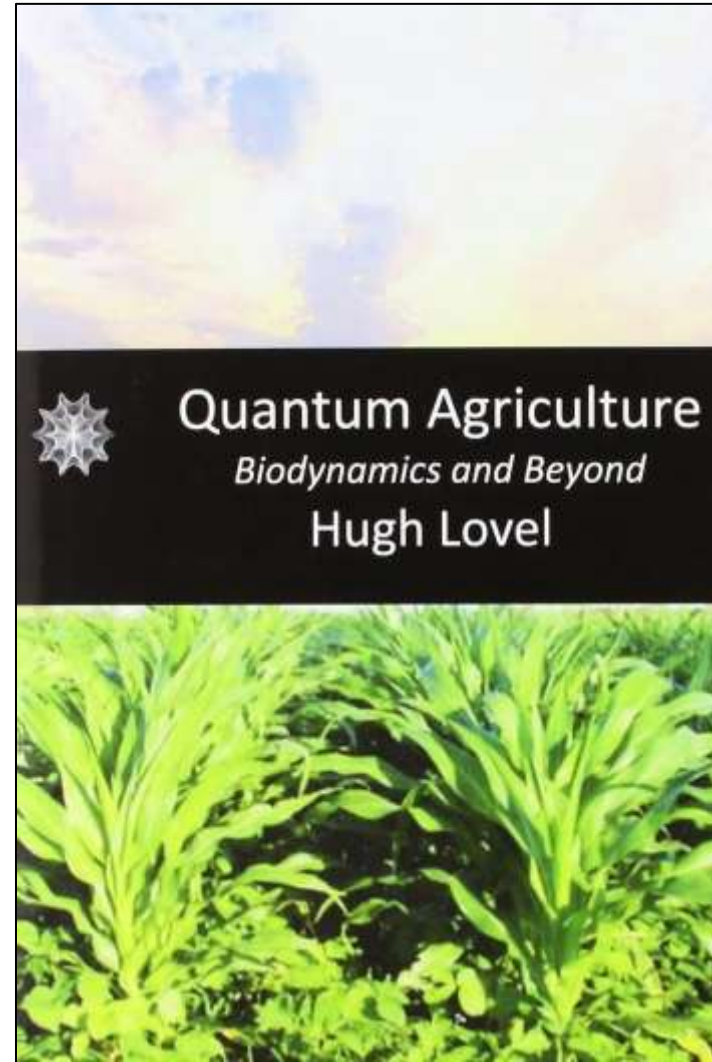
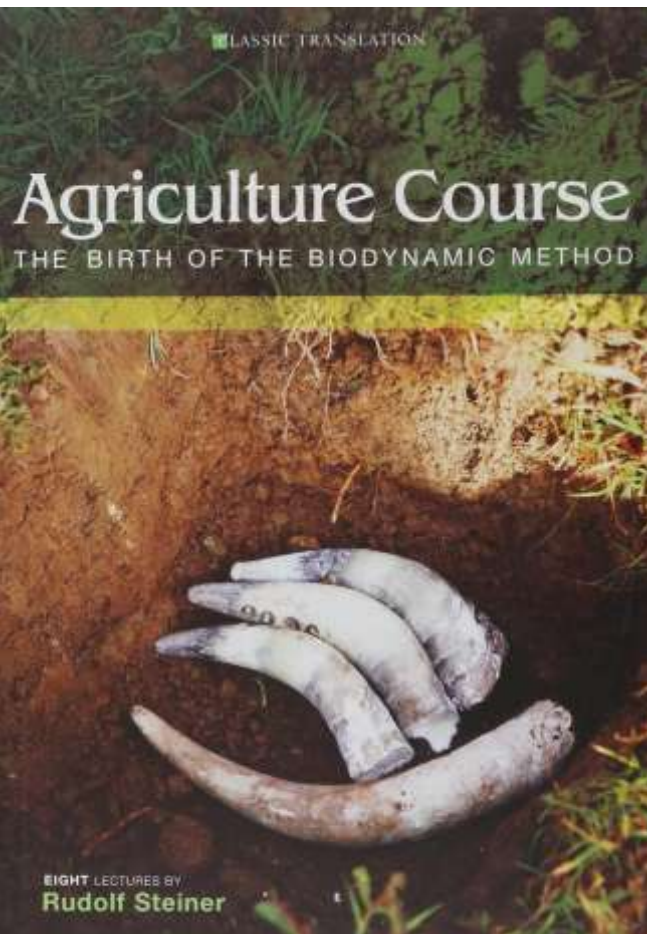


“Magical” Water



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)



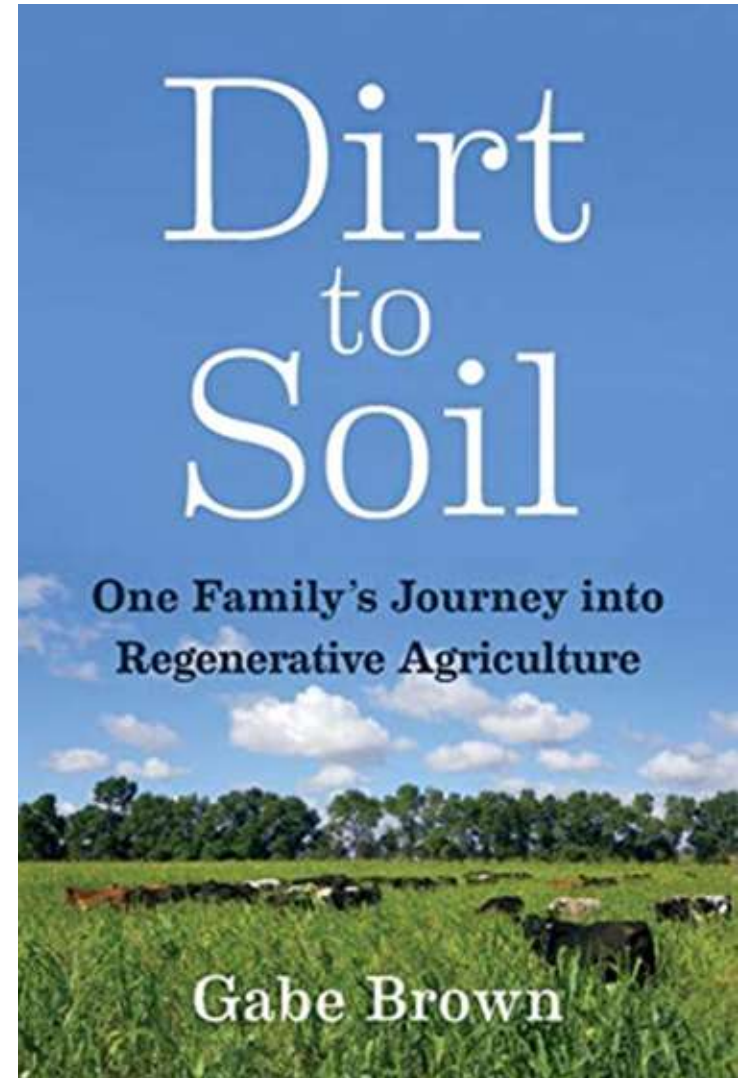
What Not to Do!





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

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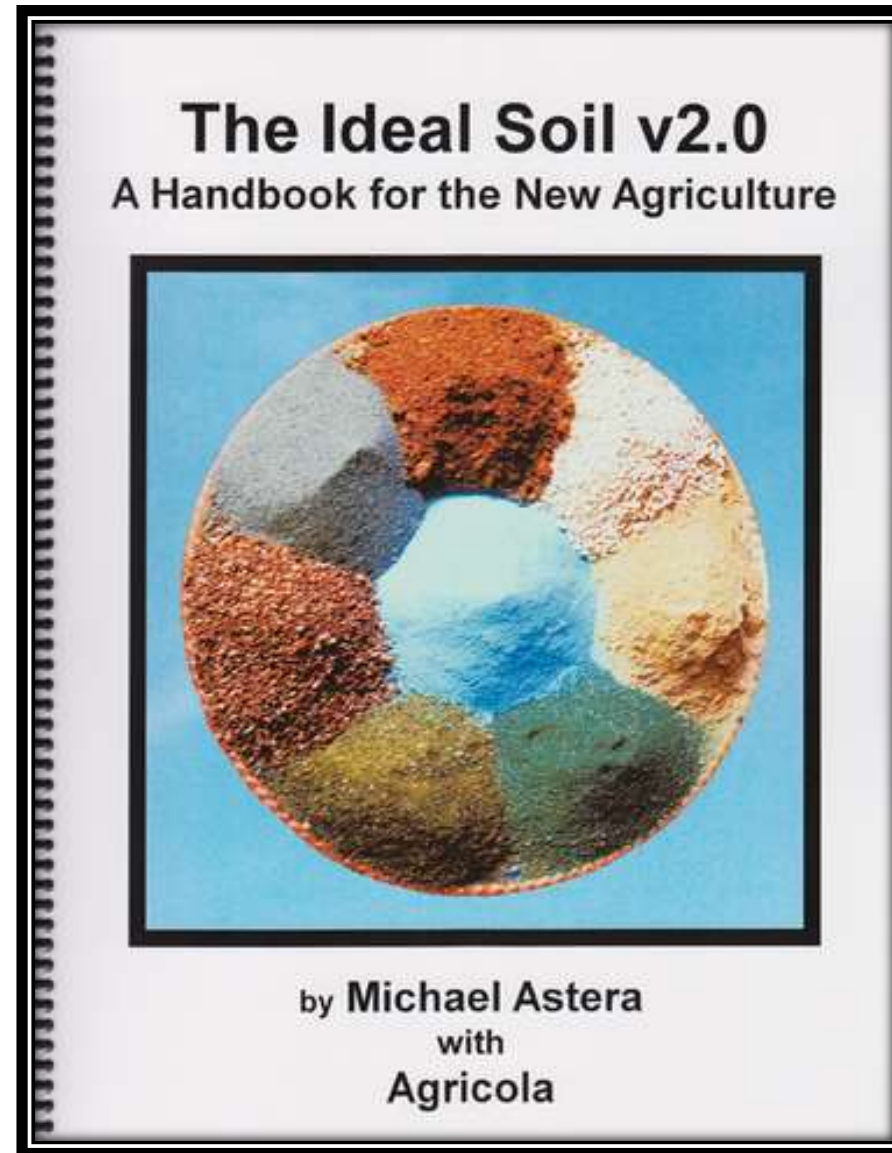
Dr William Albrecht



University of Missouri

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

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 - 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)

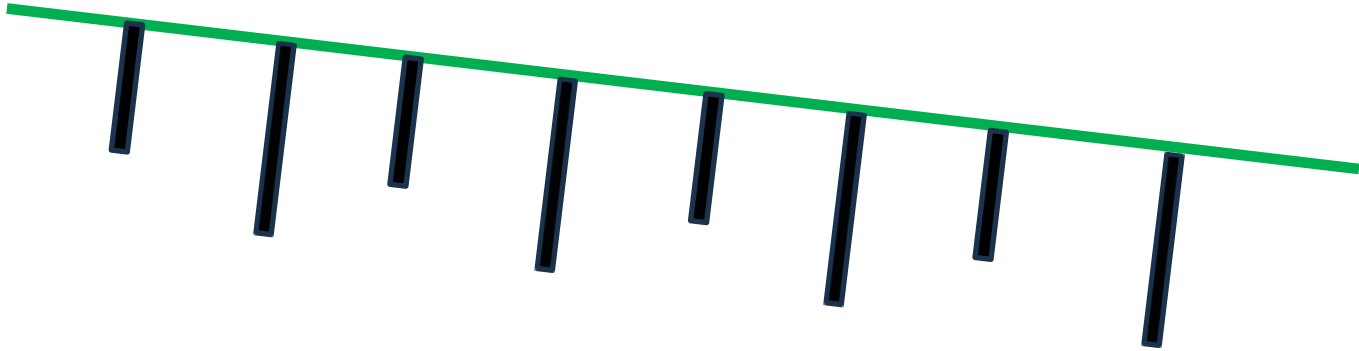




AIR



WATER FLOW



SUBSOILER CUTS

Subsoiler



Product Weight: 635 lb.

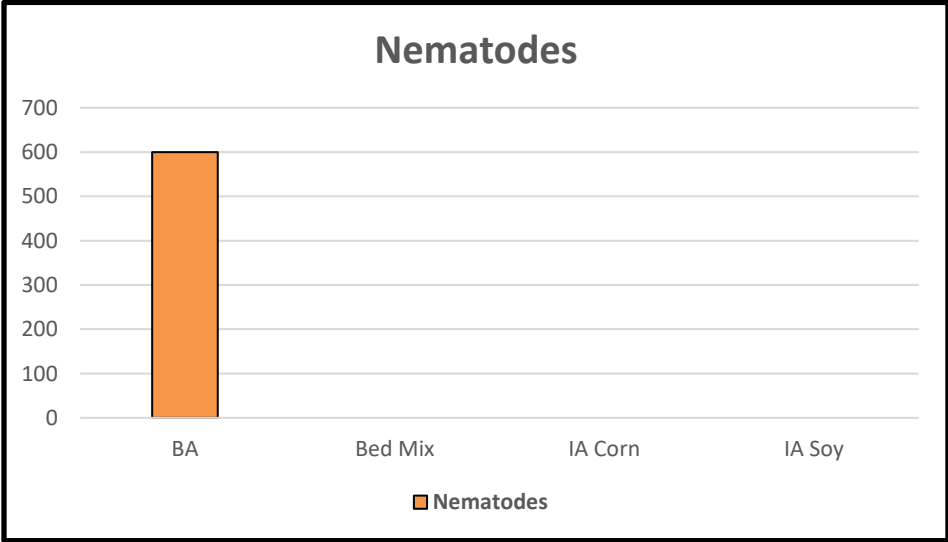
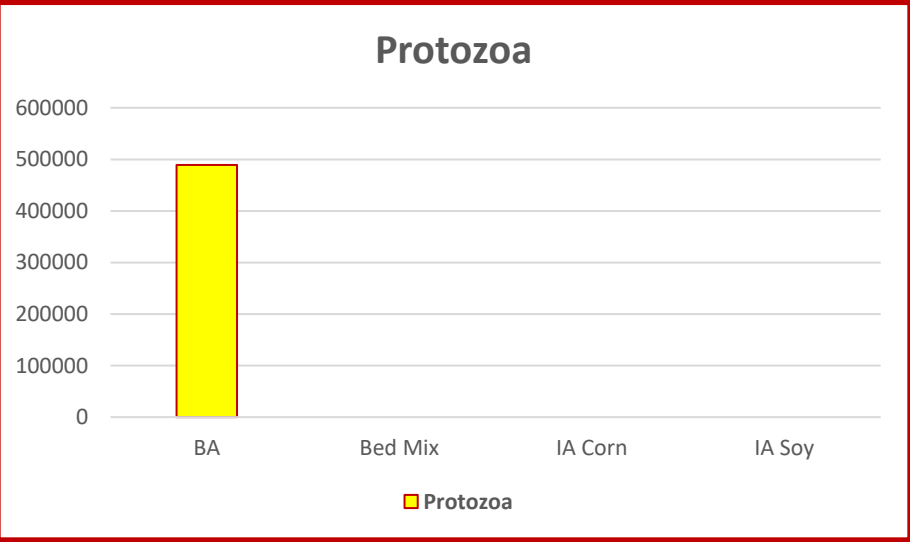
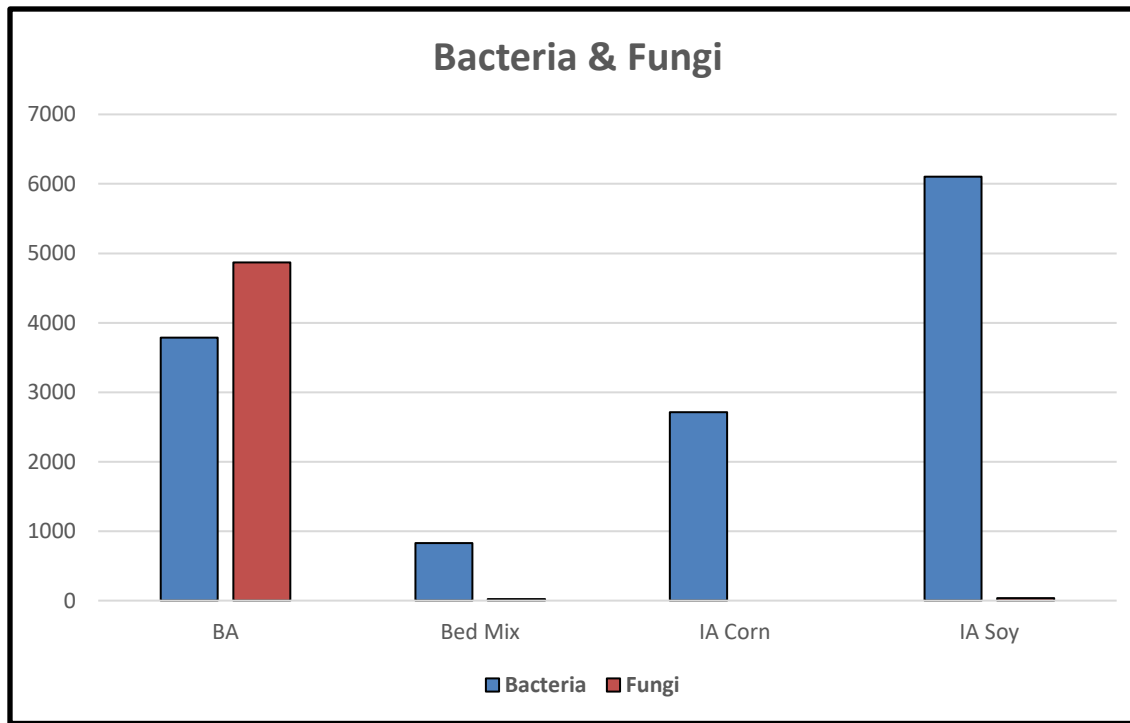






Garden Repair (2021)

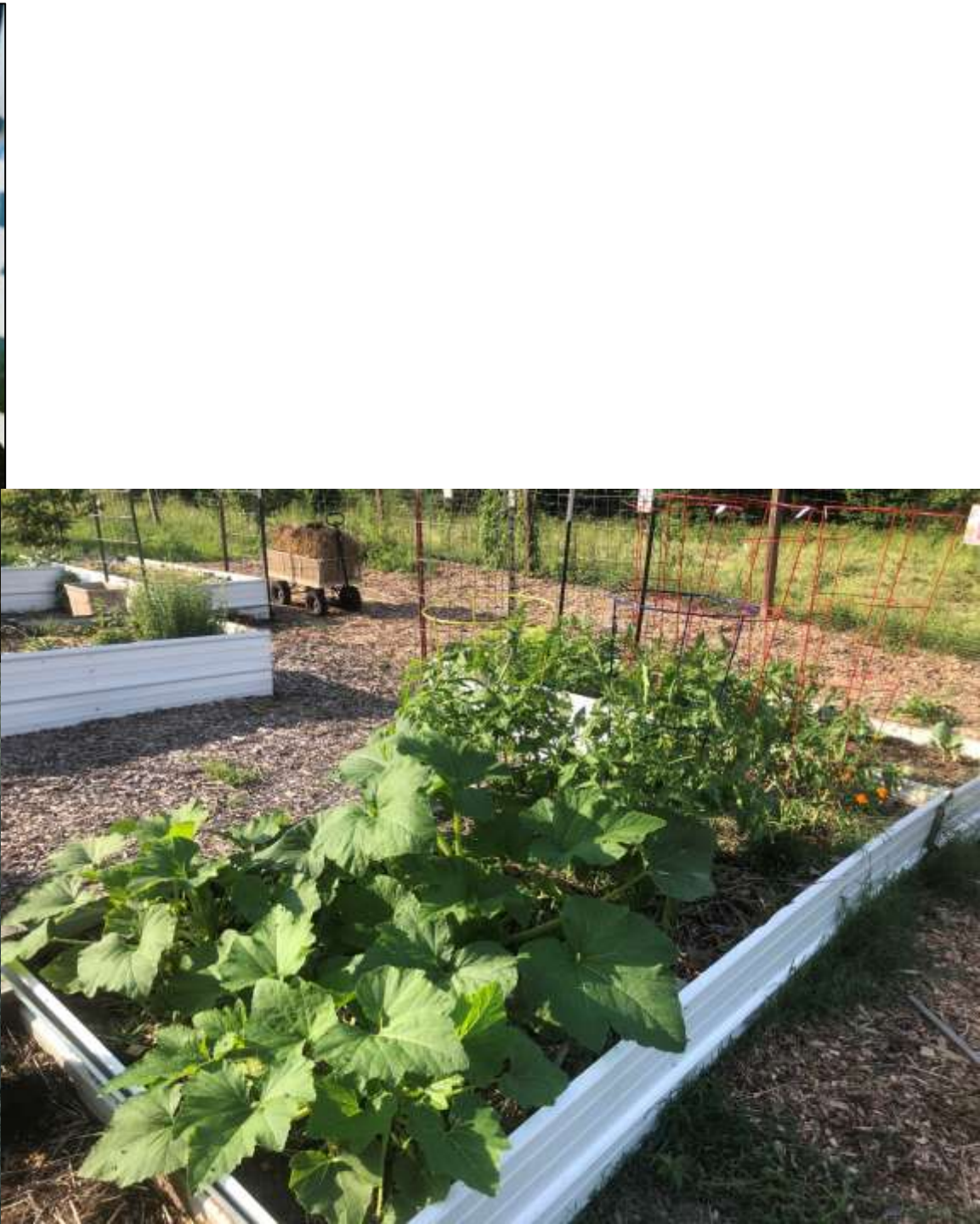




Garden Repair (Fall 2021)

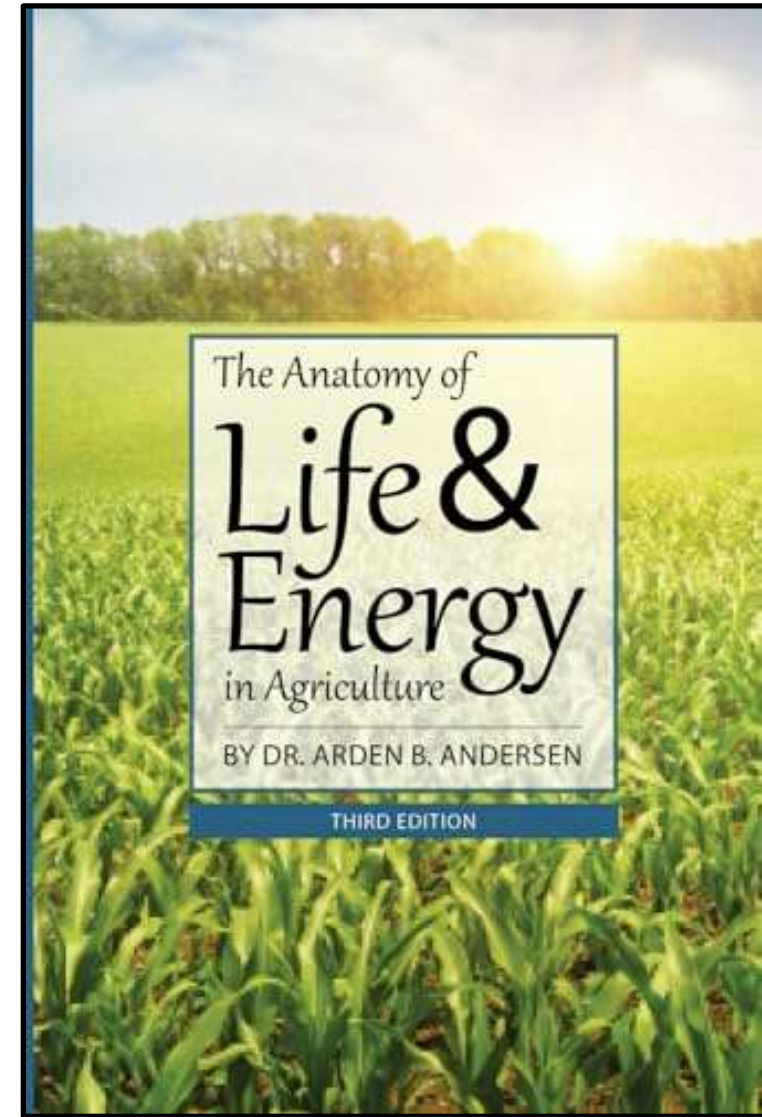






Dr Arden Andersen

- (All per 1000 ft²)
- Soft Rock Phosphate 12 lbs
- High-calcium lime 23-46 lbs
- Ammonium sulphate 2.3 lbs
- Compost 12-184 lbs



Foliar Sprays--KNF





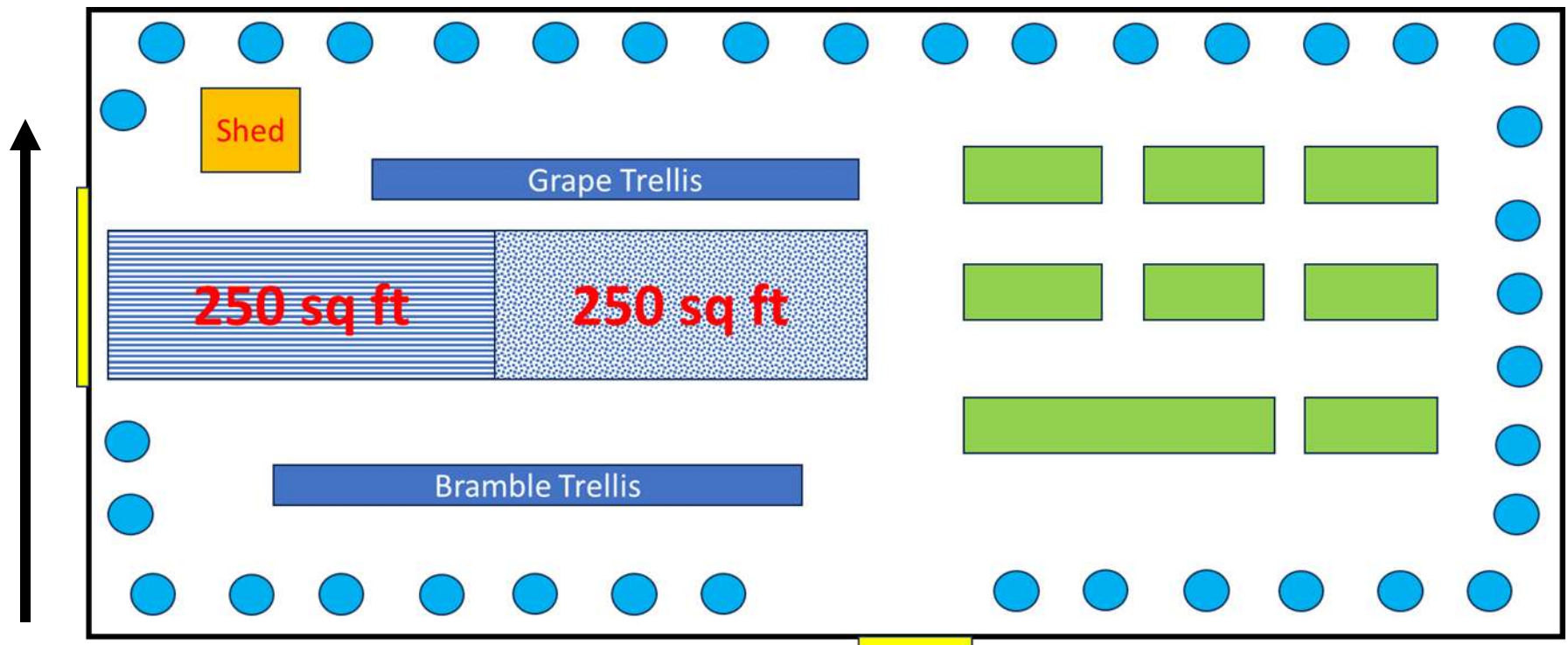


Garden Example (21 Apr 25)



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



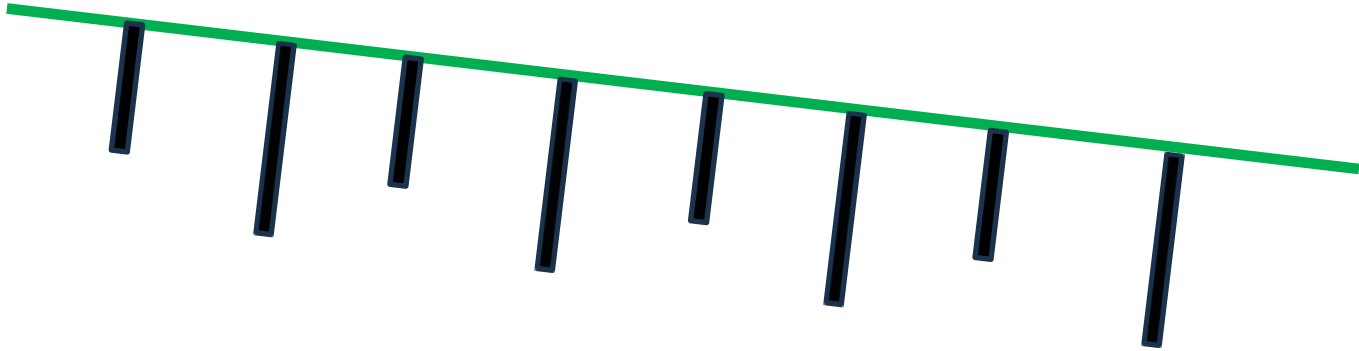
Penetrometer--Compaction



AIR



WATER FLOW



SUBSOILER CUTS



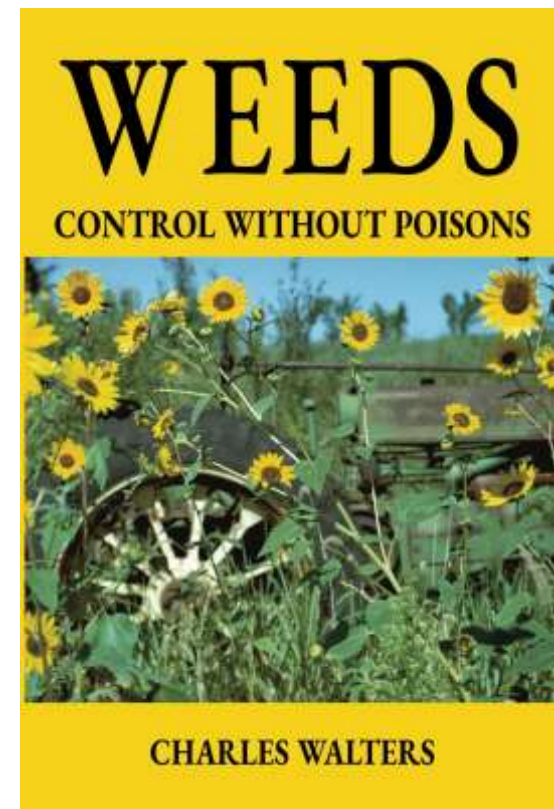
TIMELINE (16 Oct 24)

- 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 ft²)
- 1 lb Redmond West
 - (4 lbs/1000 ft²)



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

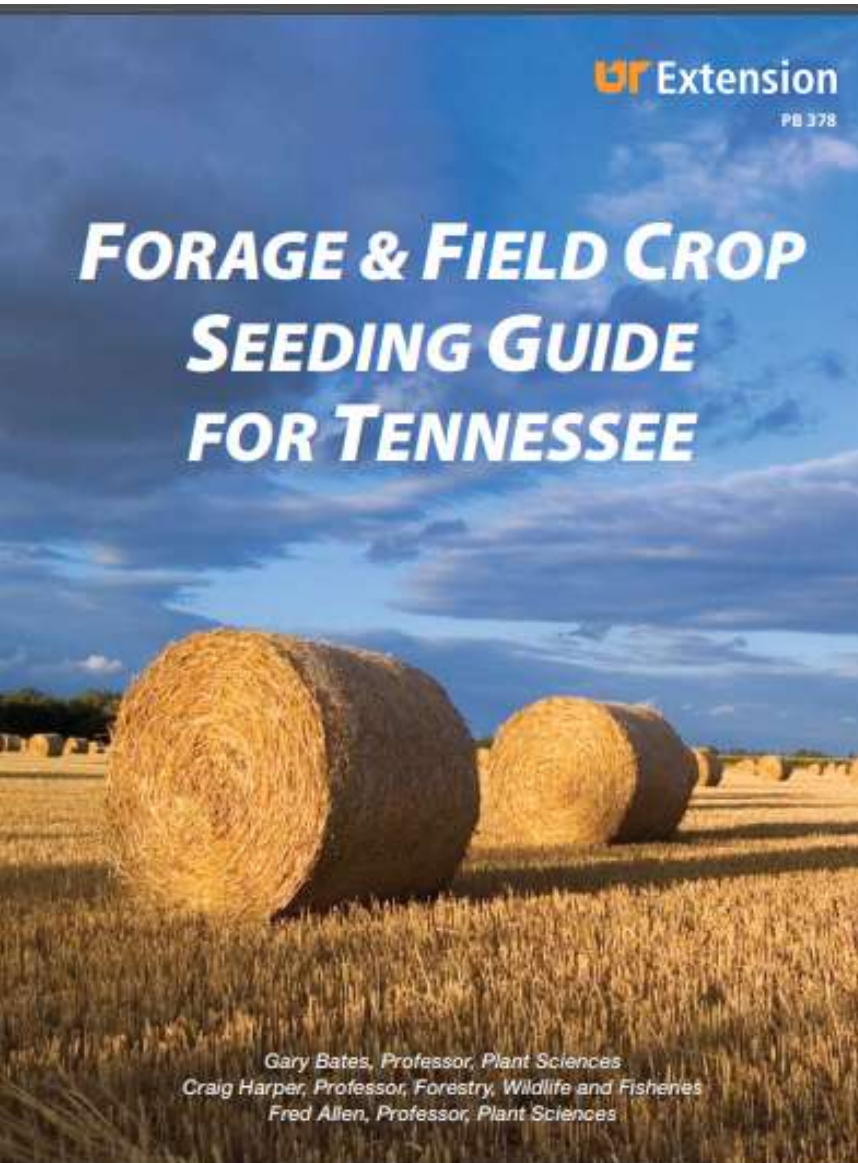


TIMELINE (24 Dec 24)

- 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

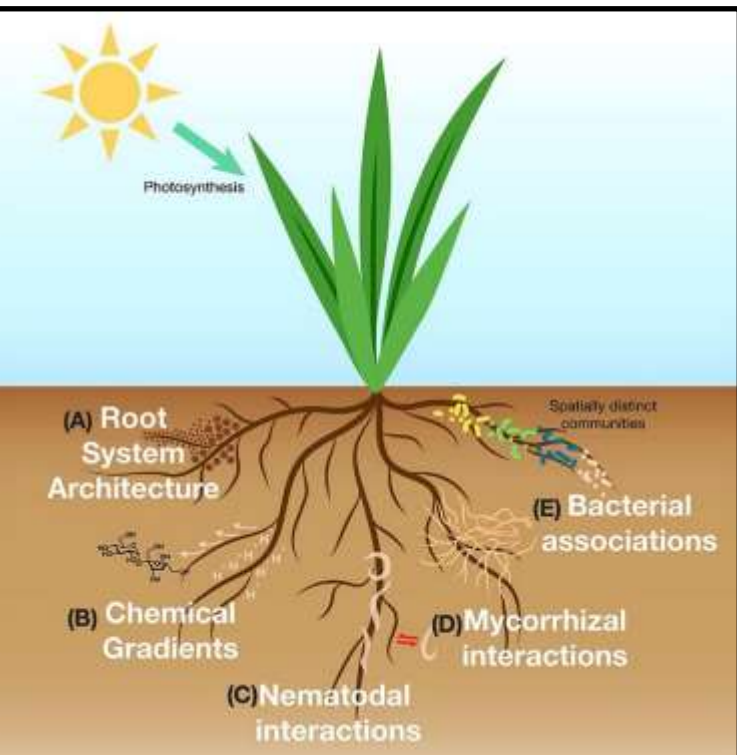




Photo Source: Soil Science Society of America

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)



What are you looking for?

Seed

Food Plots

Mixes

Milpa

Inoculants

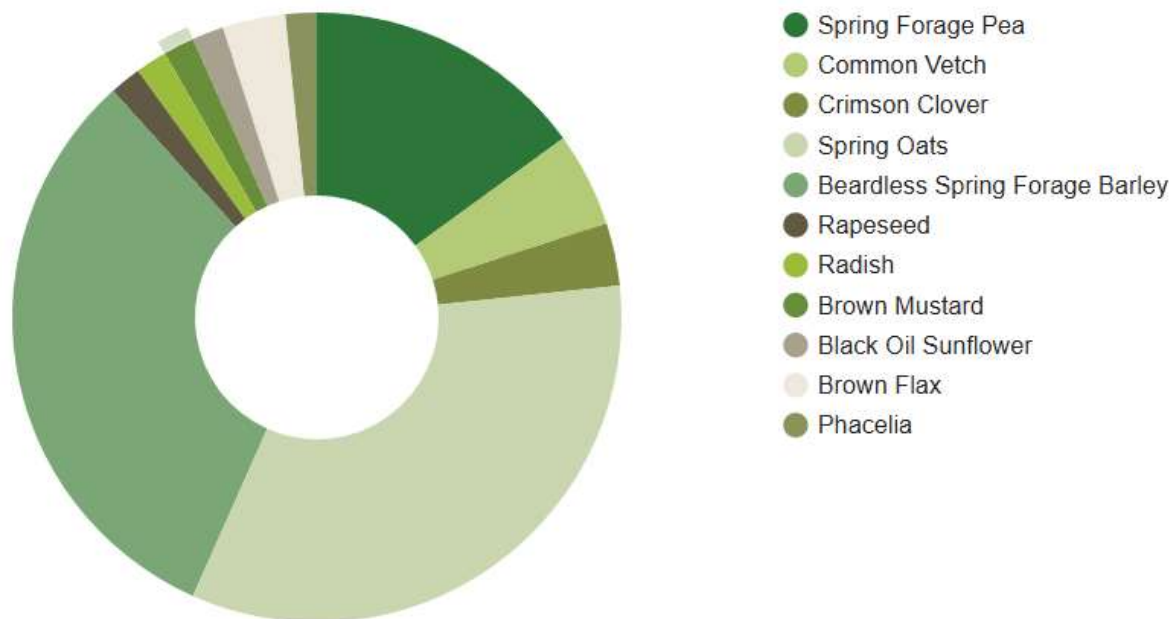
Resources

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



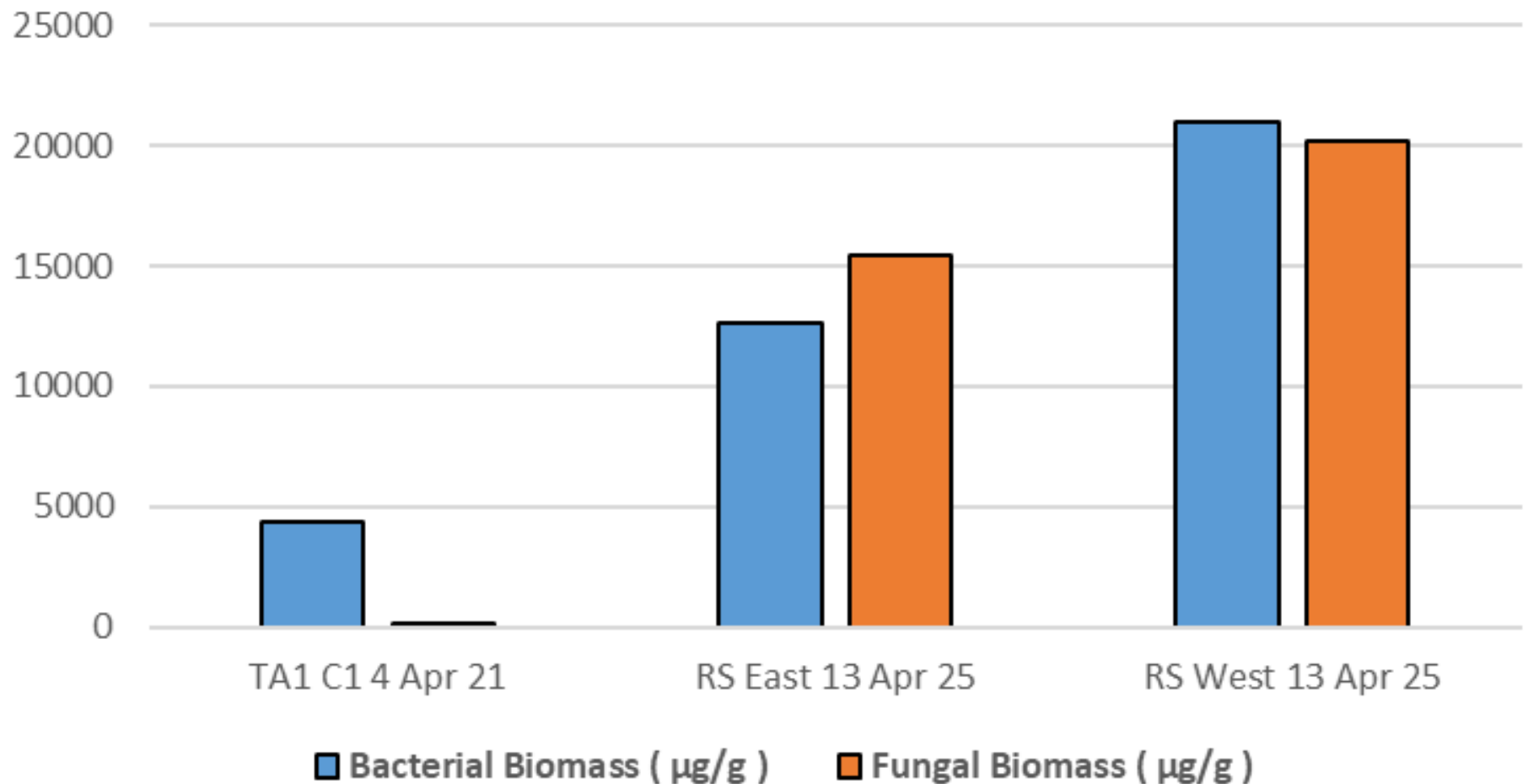
TIMELINE (8 Apr 25)

- Shovel Test



Soil Samples (Apr 13, 2025)

Bacteria & Fungi



TIMELINE (14 Apr 25)

- Straw
- 2.5 lbs Calusolv East
 - (10 lbs/1000 ft²)
- 1 lb Redmond West
 - (4 lbs/1000 ft²)



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)!!

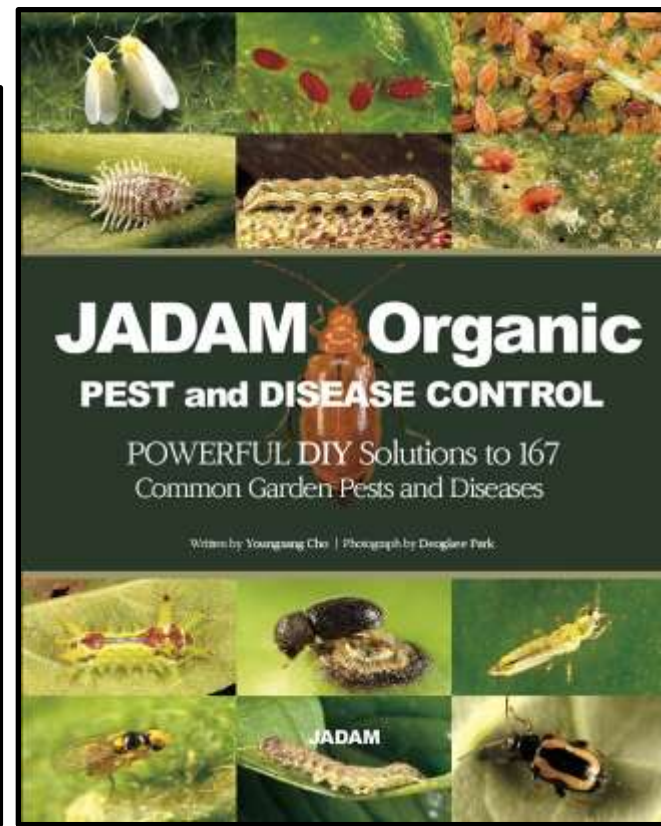
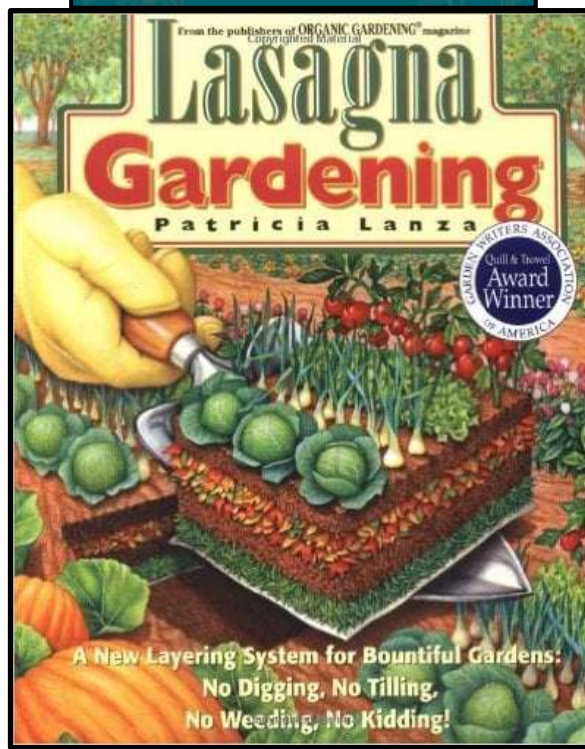
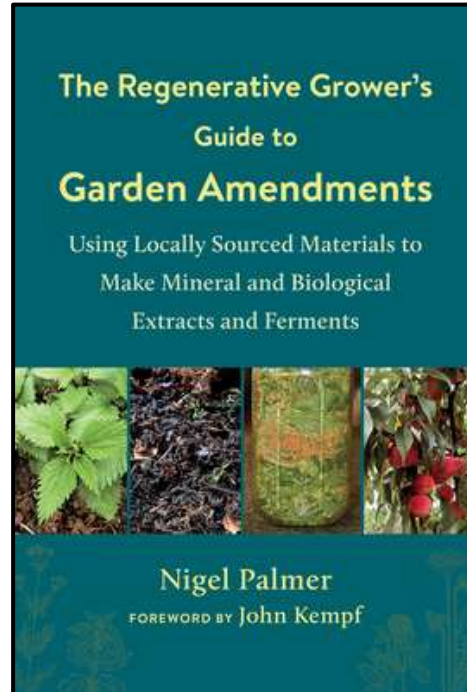
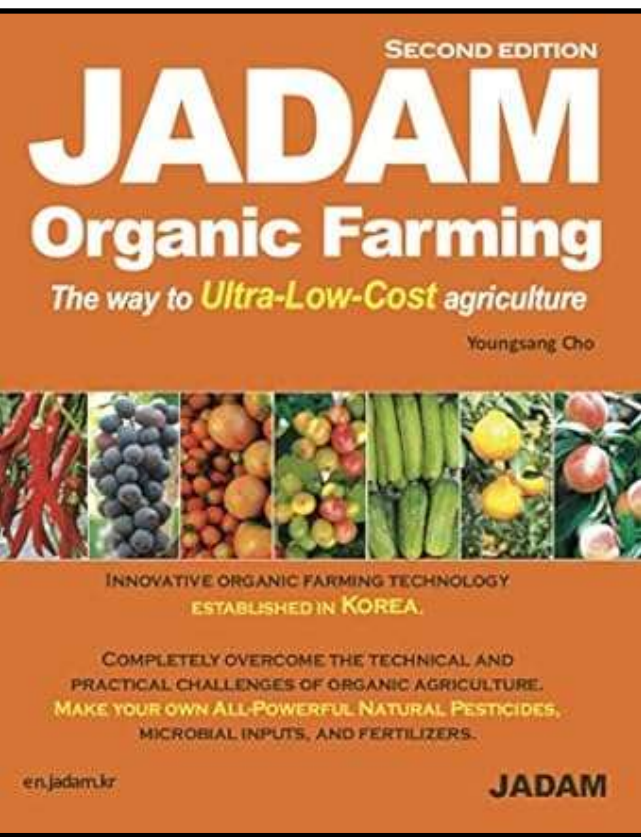






22 Nov 25 & 23 Jan 26

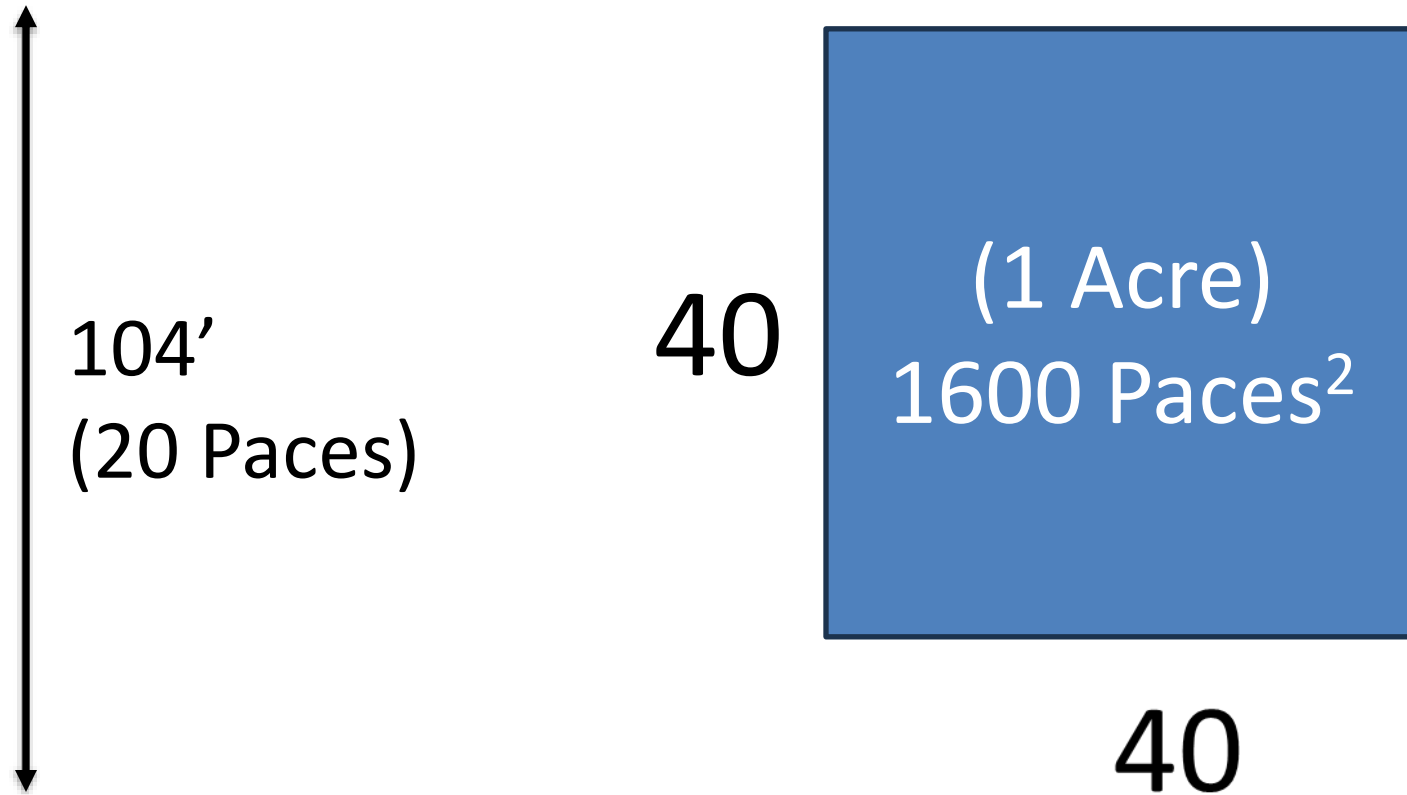




Pasture Example



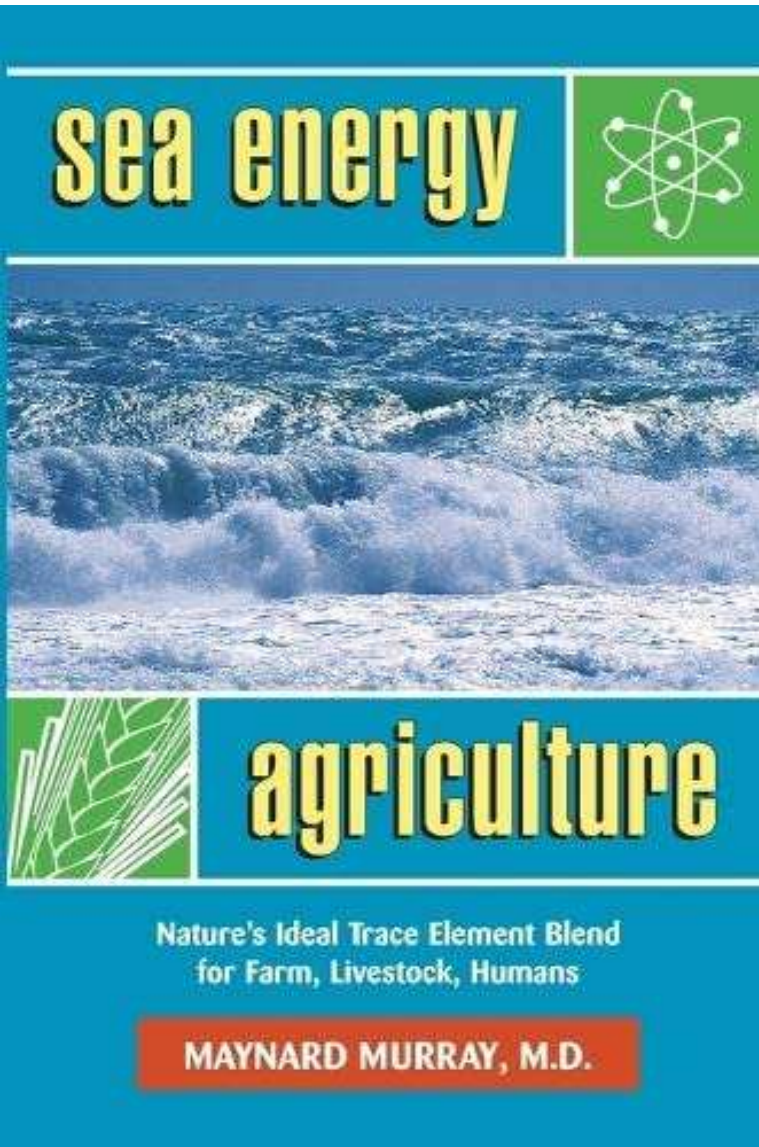
Pace Count



Context (2015-2020)

- $\approx 1/3$ 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

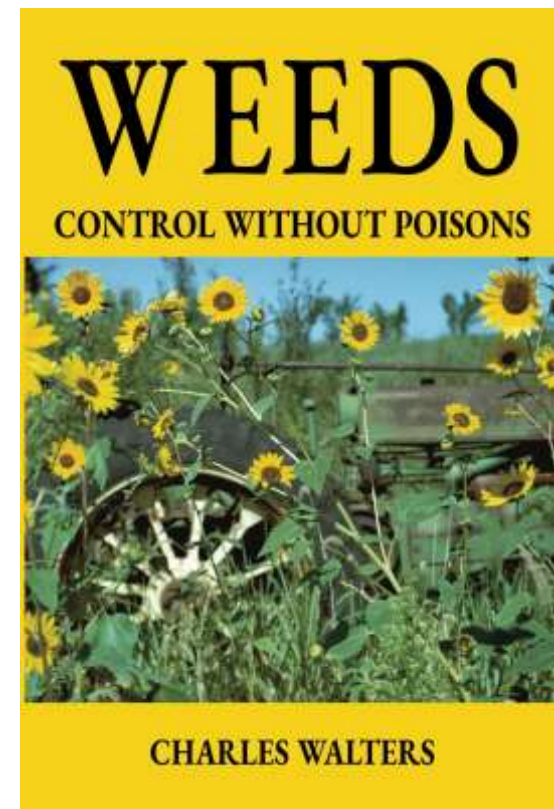
Sea Water Minerals



- Redmond or Sea 90
 - 200-2200 lbs/acre
- HighBrixGardens.com
 - 43 lbs/acre
 - 43 oz/acre (water)

CaluSolv (www.calusolv.com)

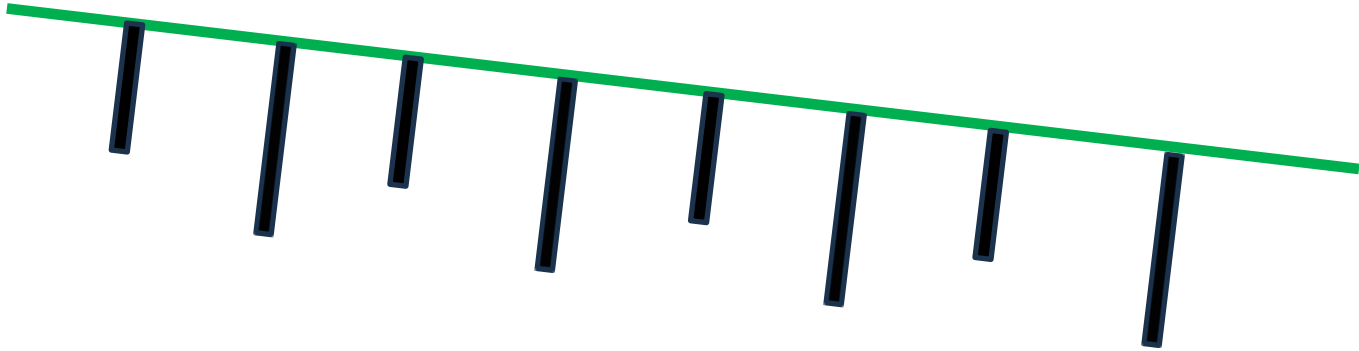
- Stan Pace, farmer, County Extension Agent
- 2005: “Weeds, Control Without Poisons.”
- Weeds there to fix Ca deficiencies
- Compaction Ca:Mg (< 5:1)
- Brett Morehouse & Chemway



AIR



WATER FLOW



SUBSOILER CUTS



Hand Seeders







A photograph of a Greenscape 600 Conservation Seeder, a piece of agricultural machinery. The machine is primarily tan-colored with green accents on the hopper and seed metering components. It is parked on a dirt surface next to a large, dark, textured object, possibly a tire or part of a larger machine. In the background, there is a wooden structure and several large metal drums. The machine has a hopper at the top, a seed metering system in the middle, and a seed delivery system at the bottom. The text "GREENSCAPE 600" is prominently displayed in green, bold, sans-serif capital letters, with a green line and a small green tree-like graphic below it. Below this, the words "CONSERVATION SEEDER" are written in smaller, black, sans-serif capital letters.

GREENSCAPE 600
CONSERVATION SEEDER



Pasture Tests (8 Plots)



<div><div></div><div></div><div></div><div></div><div>Subsoiler+</div><div></div><div></div><div></div></div>	Redmond (1600 lbs)	Redmond (800 lbs)	Redmond (400 lbs)	Redmond (200 lbs)	Calusolv (348 lbs)	Redmond (100 lbs)	Calusolv (348 lbs)
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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)









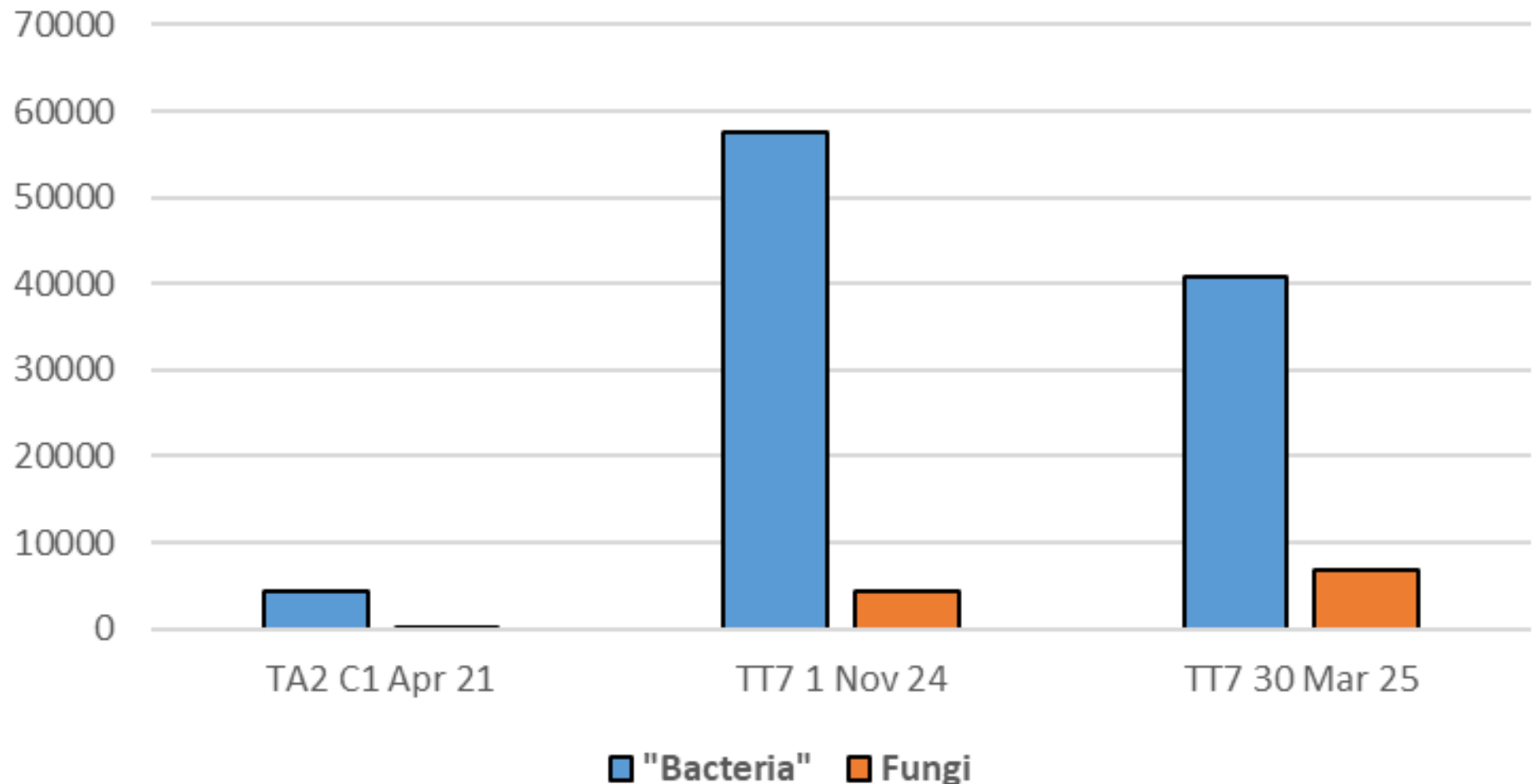
TIMELINE (8 Apr)

- Shovel Test



Soil Samples (Apr 13, 2025)

TT7 Bacteria & Fungi (1600 lbs/acre)



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/>)