Raising Microbes—The Secret to Your Own "Living Soil"

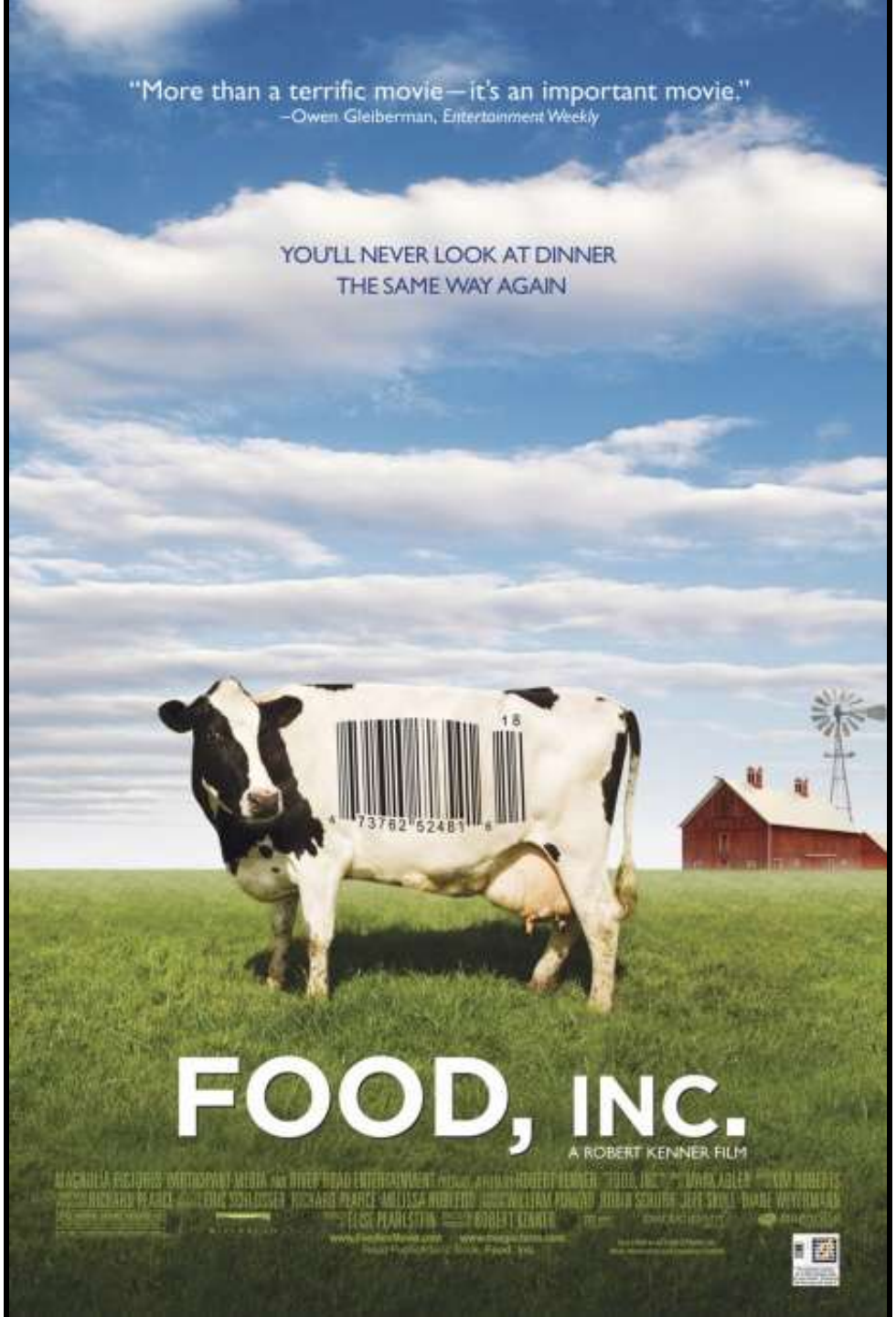
(7 Jun 25)

HUGE Topic!!!

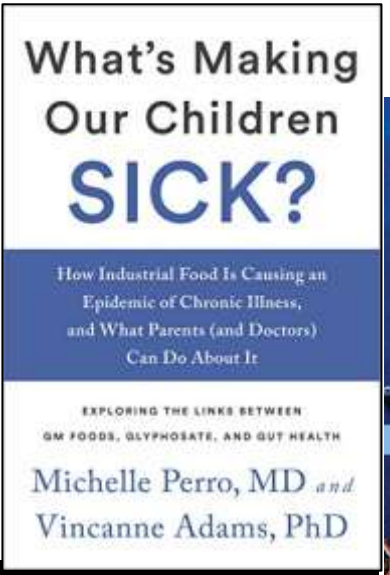
- www.Libertytracefarm.com
- References “Books and Resources” Tab
- Slides “Living Soil” Tab
- Links Last Year’s Presentations (2024)
  - (Beginner & Advanced)

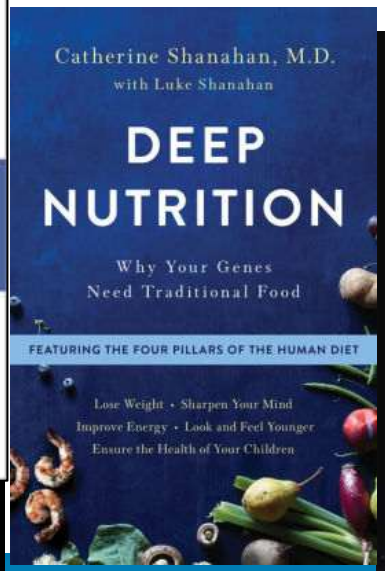
Objectives

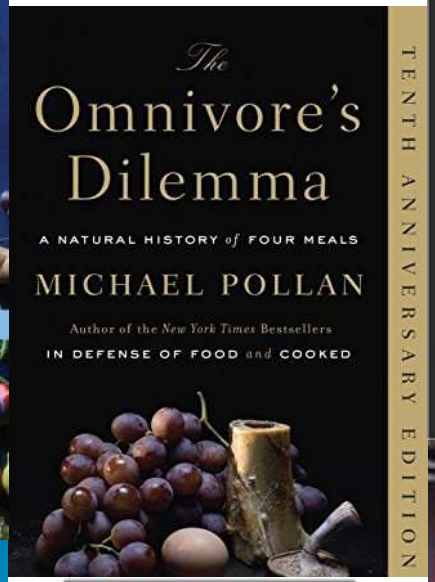
- Brief Background
- Importance of Microbes in Soil
- How to Raise Your Own Microbes

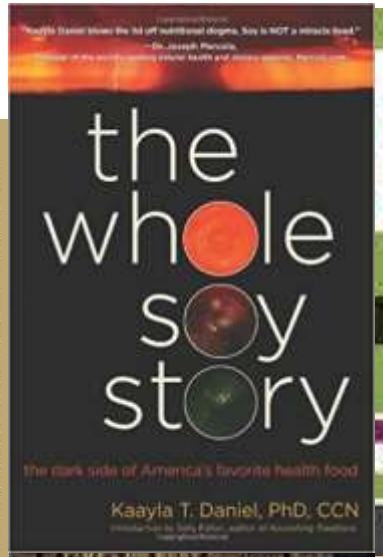

"More than a terrific movie—it's an important movie."
–Owen Gleiberman, Entertainment Weekly
YOU'LL NEVER LOOK AT DINNER
THE SAME WAY AGAIN
FOOD, INC.
A ROBERT KENNER FILM

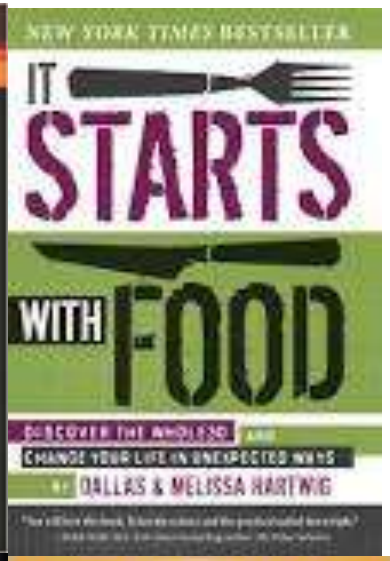
2008 and Every Day Since…

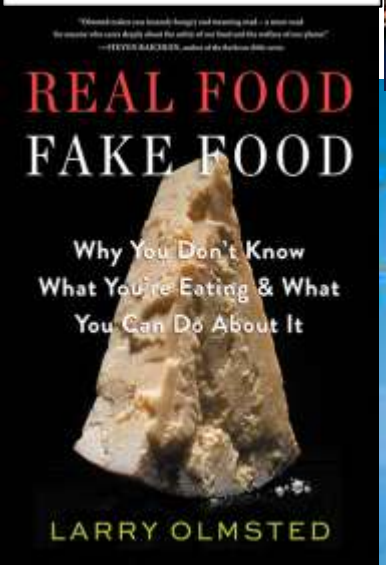


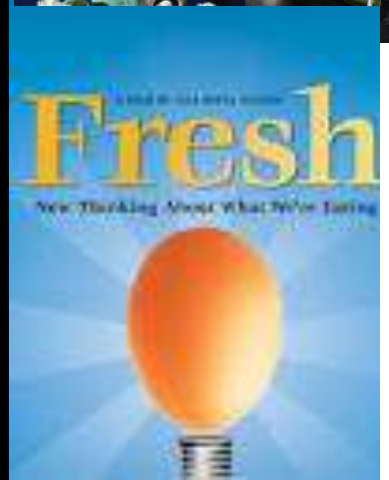


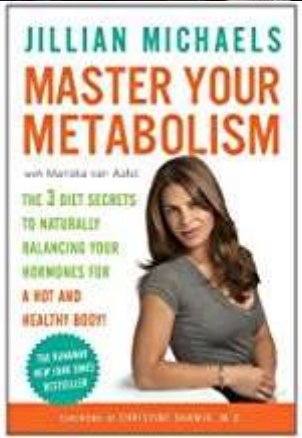


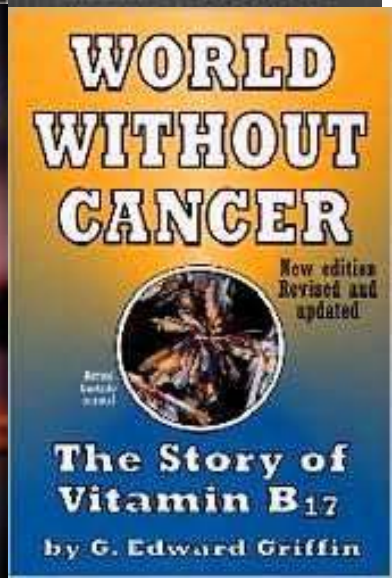




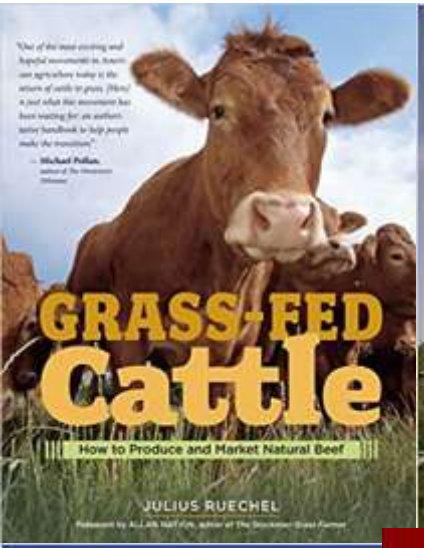


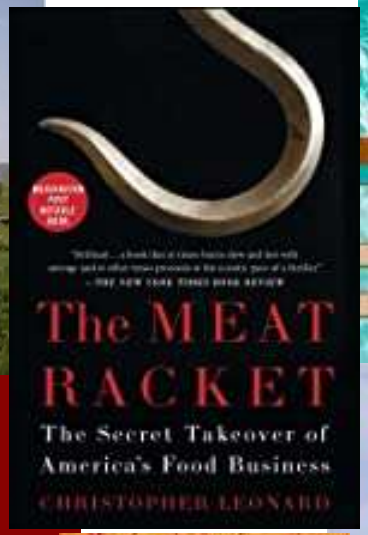


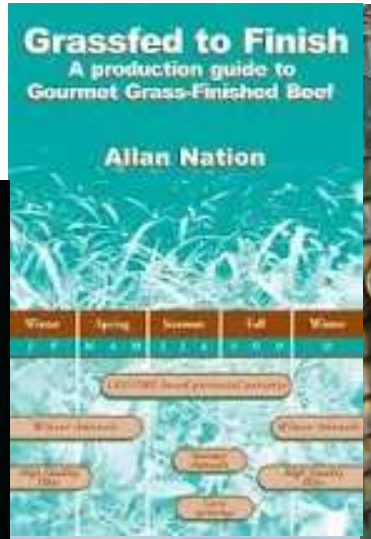


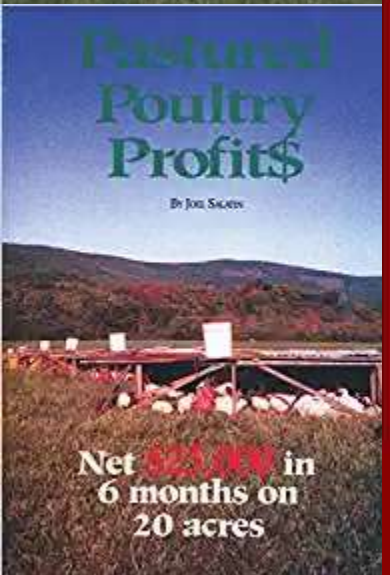


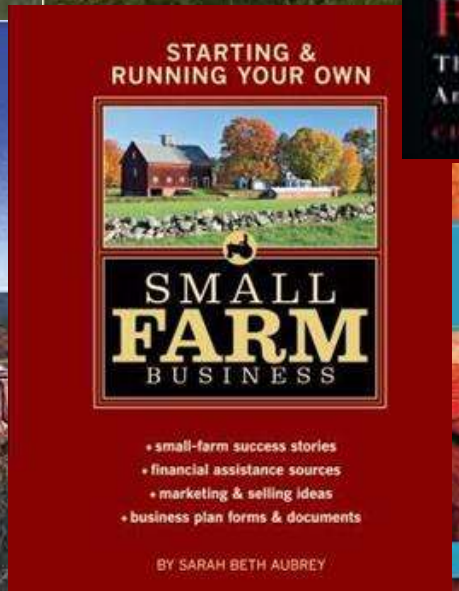
Let’s Start a Farm!

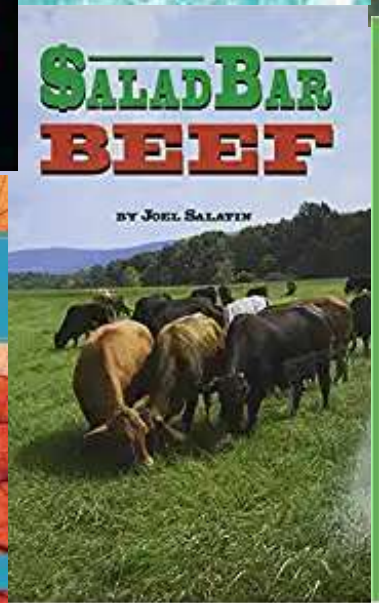


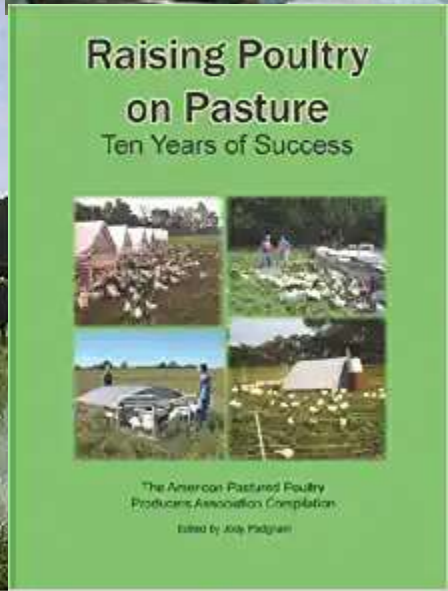












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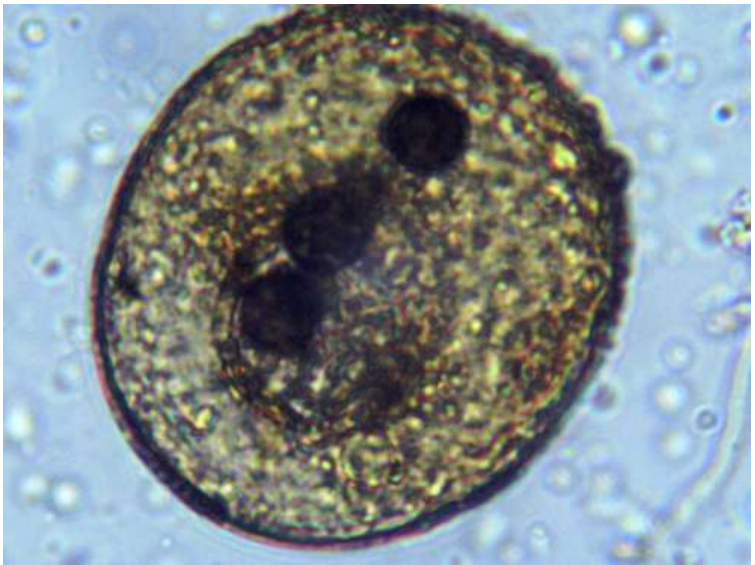
Women'sHealth.

SPURS

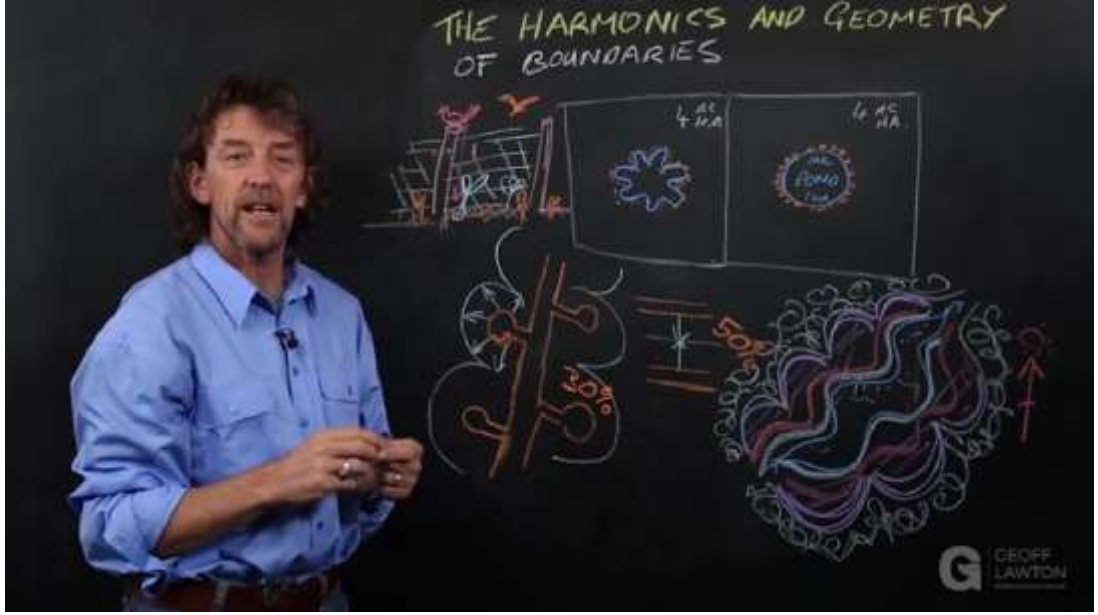
TIME

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

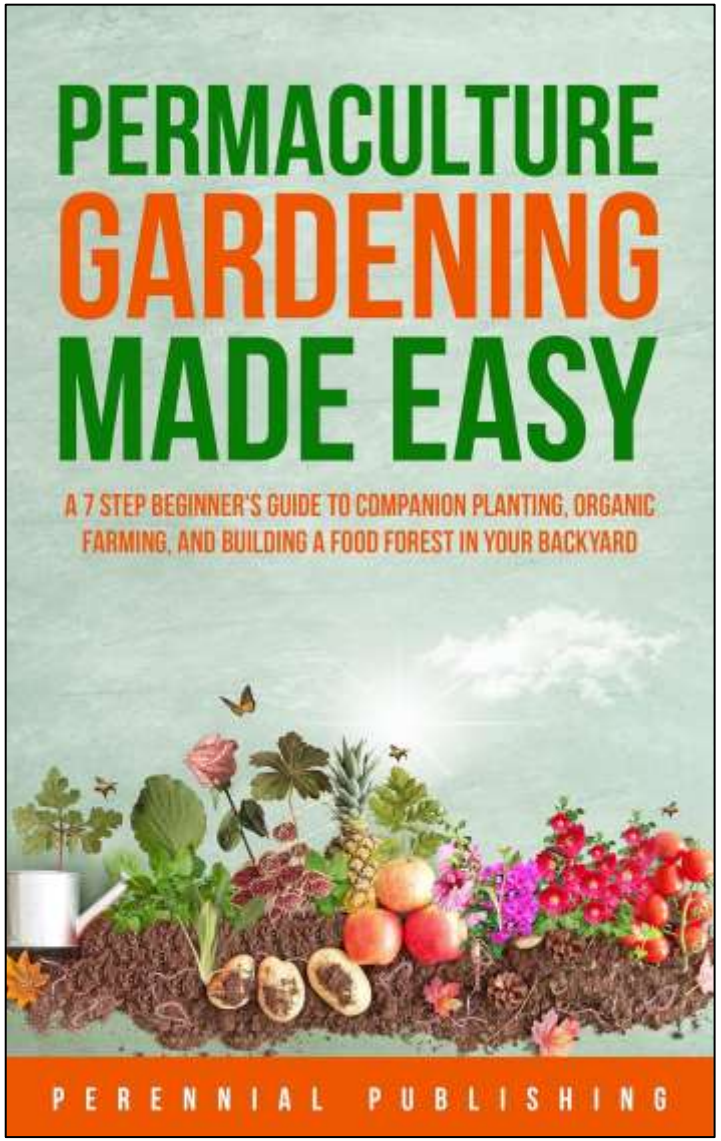
- Korean Natural Farming—Chris Trump
  - 2000 years of Korean/Japanese farming
- **Biology is most important ingredient**

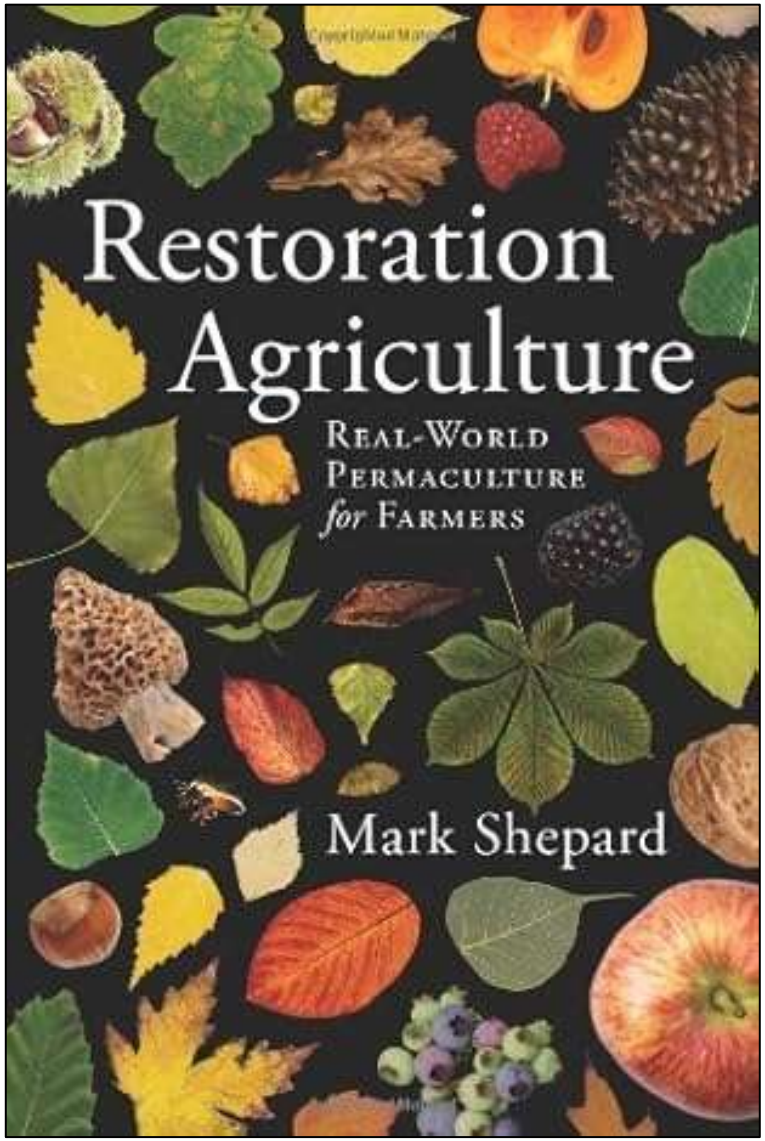


Geoff Lawton's

Permaculture Design Certification

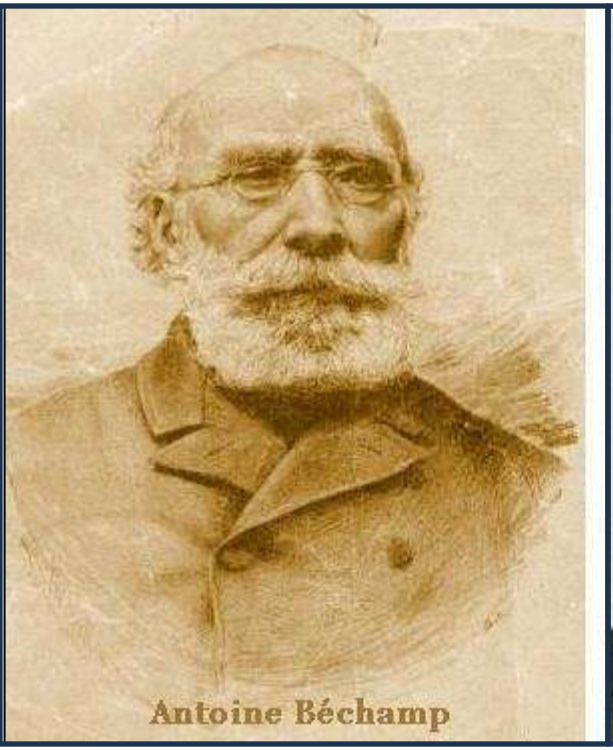
Permaculture for the Homesteader

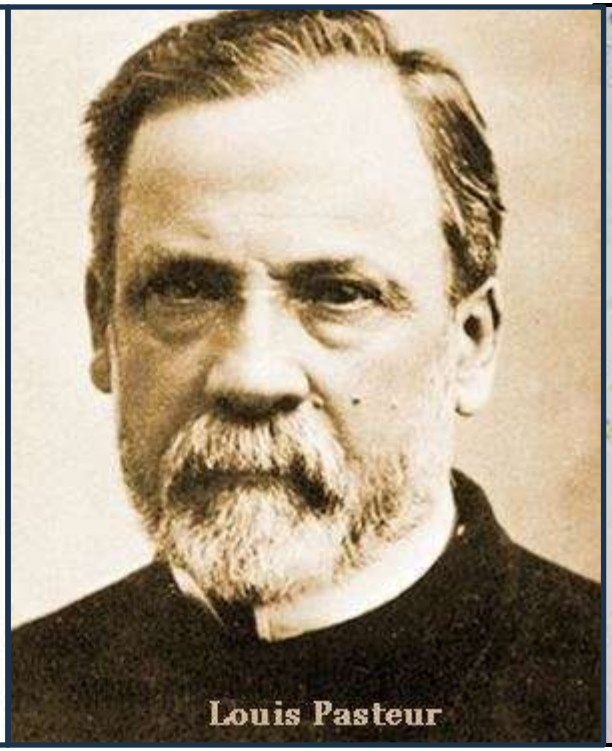


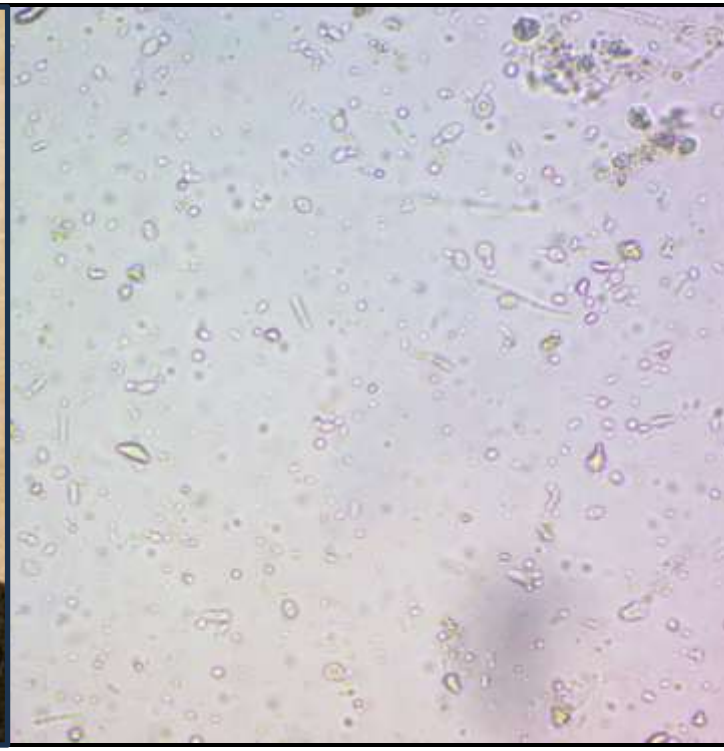


Hmmm—”Germs”

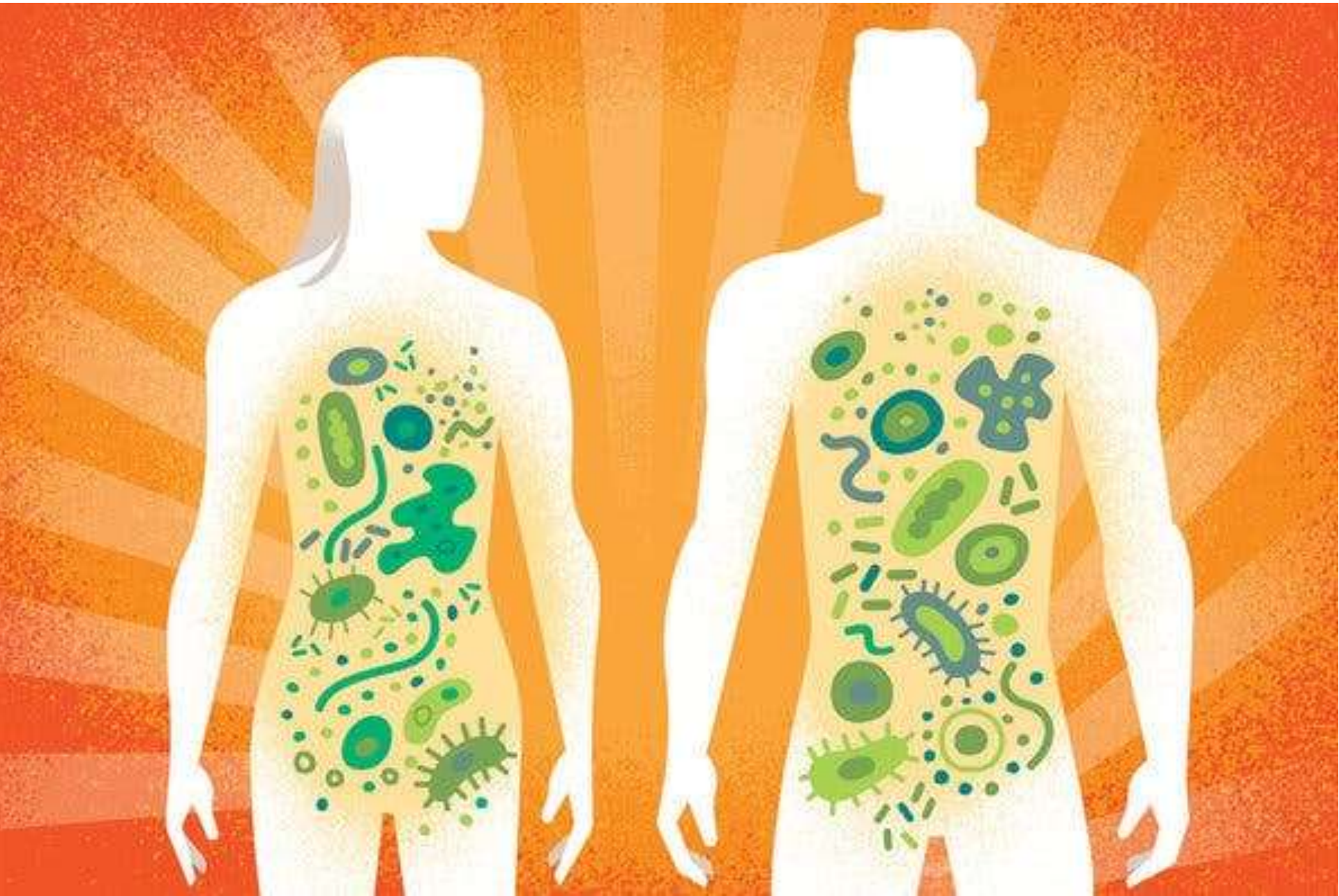
- Dr Louis Pasteur—”Germ Theory”





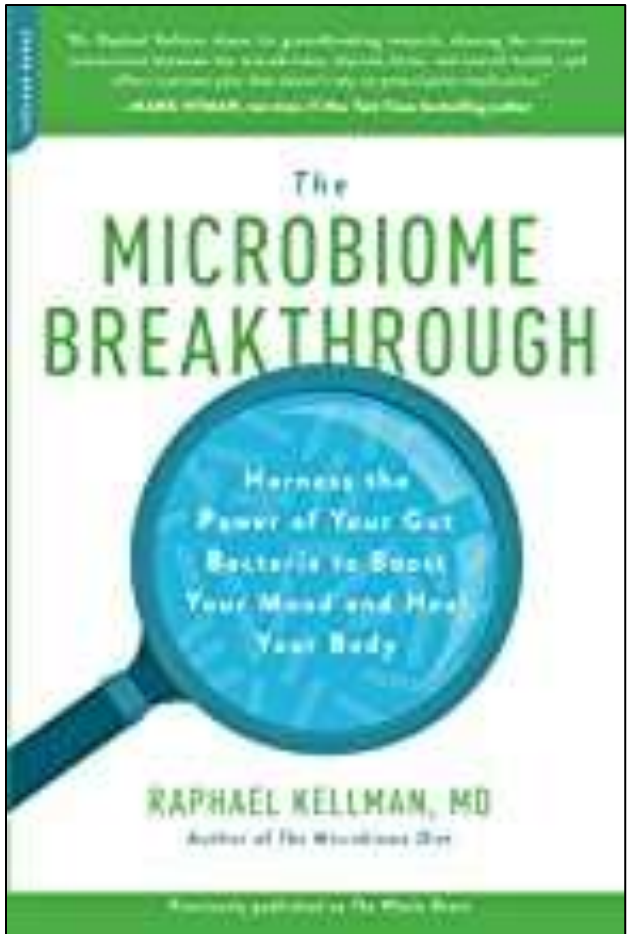


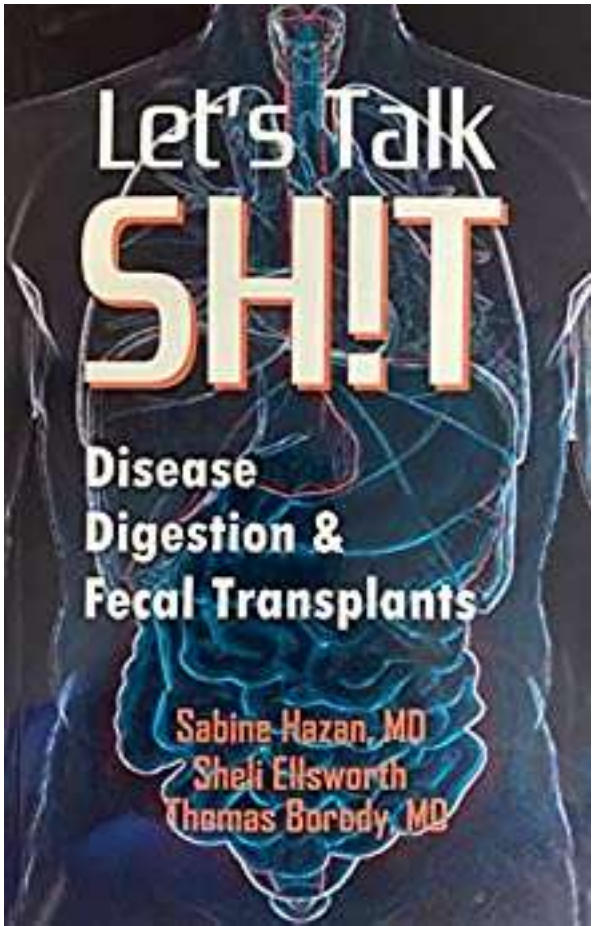
We’re Products of Biology!

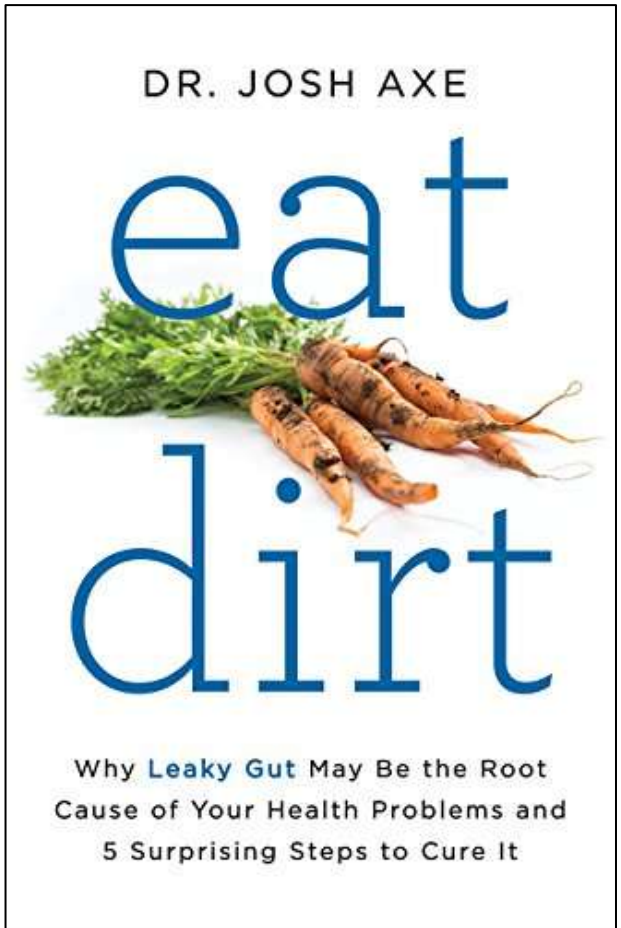


2016 Human Microbiome

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





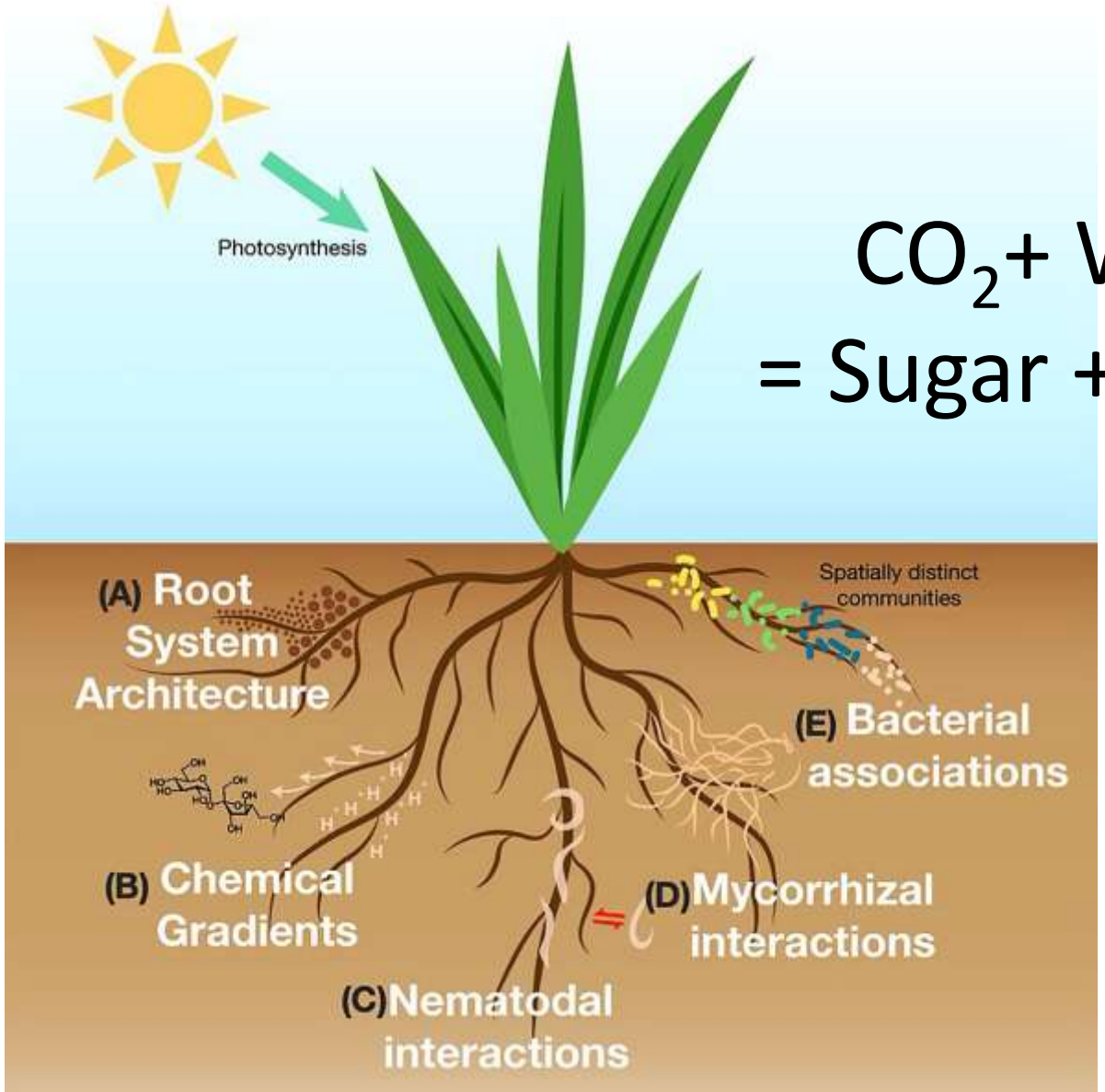


Biology
Plants have Microbiome Too!!

- 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
  - Create humus
  - Diversity keeps all "in check"

- Inject Nutrient Density at bottom of food chain

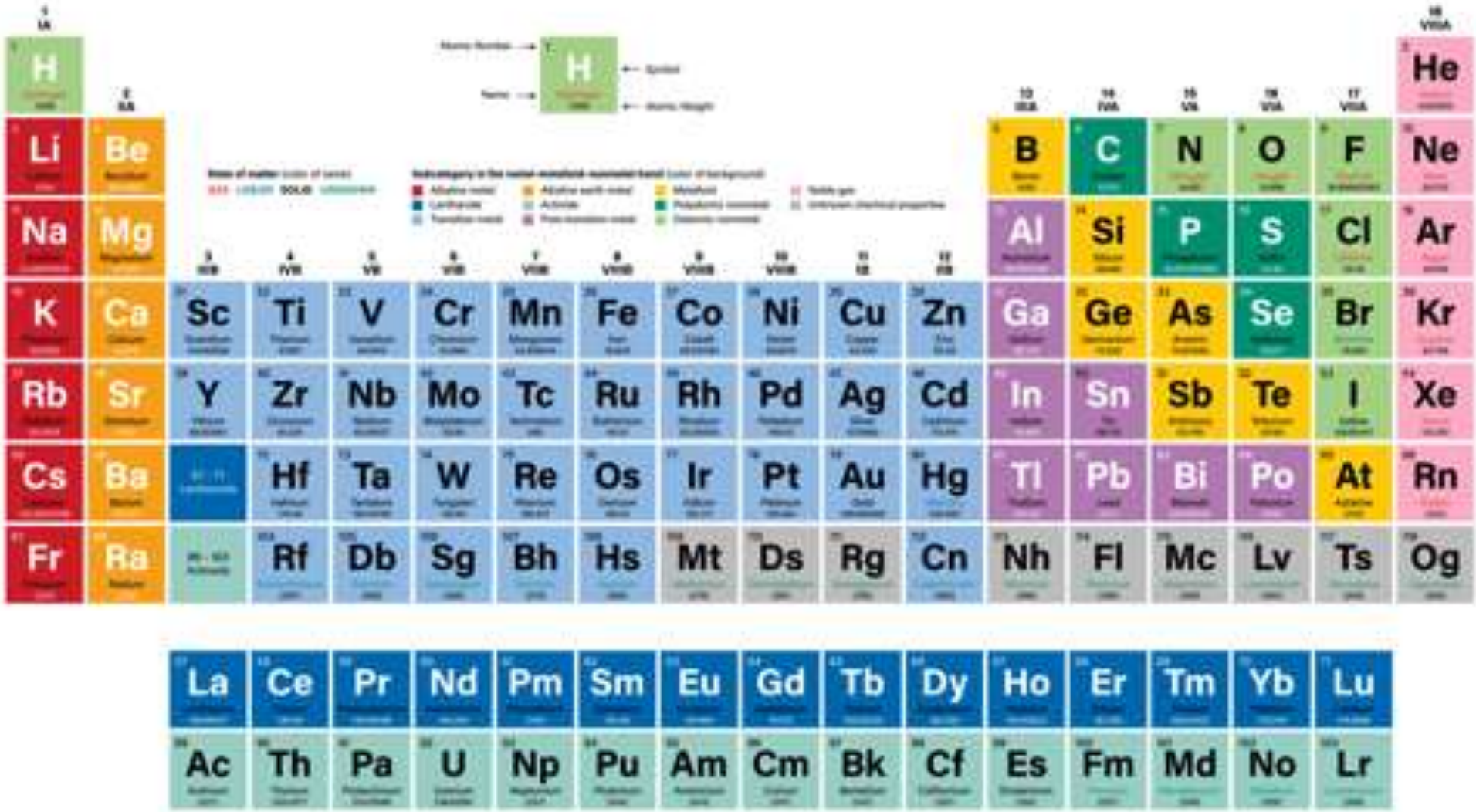
Nutrient Density



CO_2+ Water
= Sugar + Oxygen

Photo Source: Soil Science Society of America

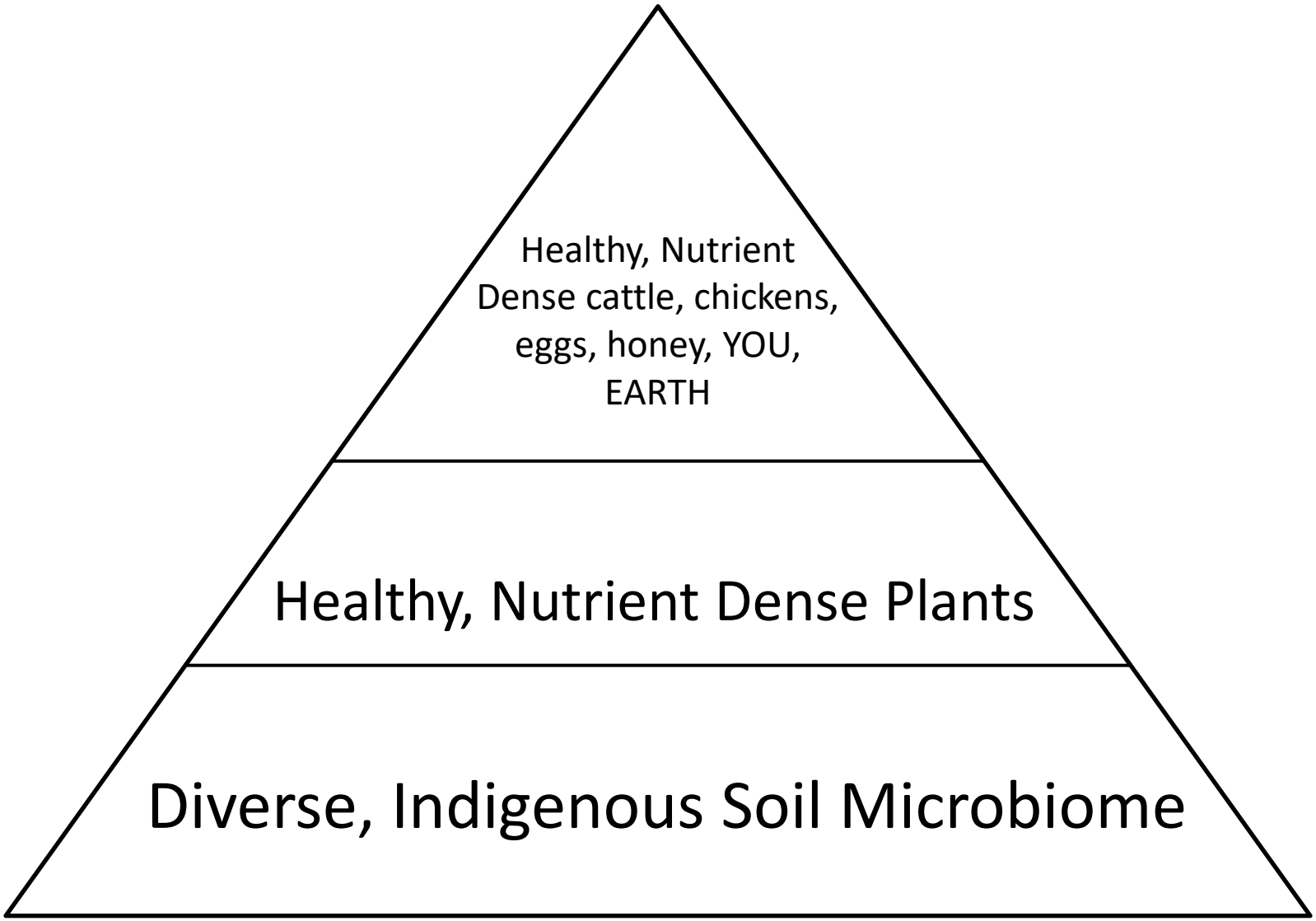
Periodic Table of the Elements



Soil vs Dirt

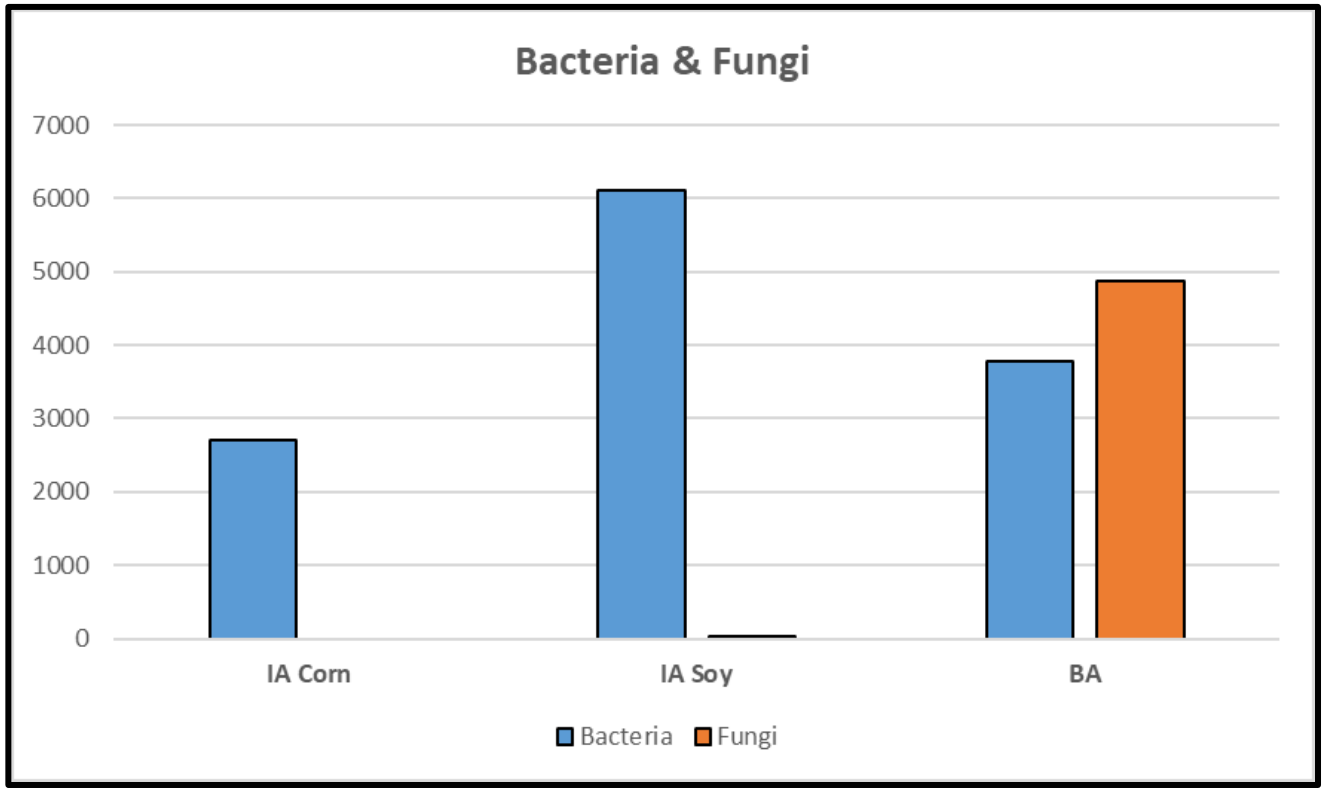
- Dirt–physical rocks, sand, silt & clay
- Soil—living skin of the planet
  - Handful of healthy soil has more critters in it than people on planet earth
  - Not just there for the “hell of it”

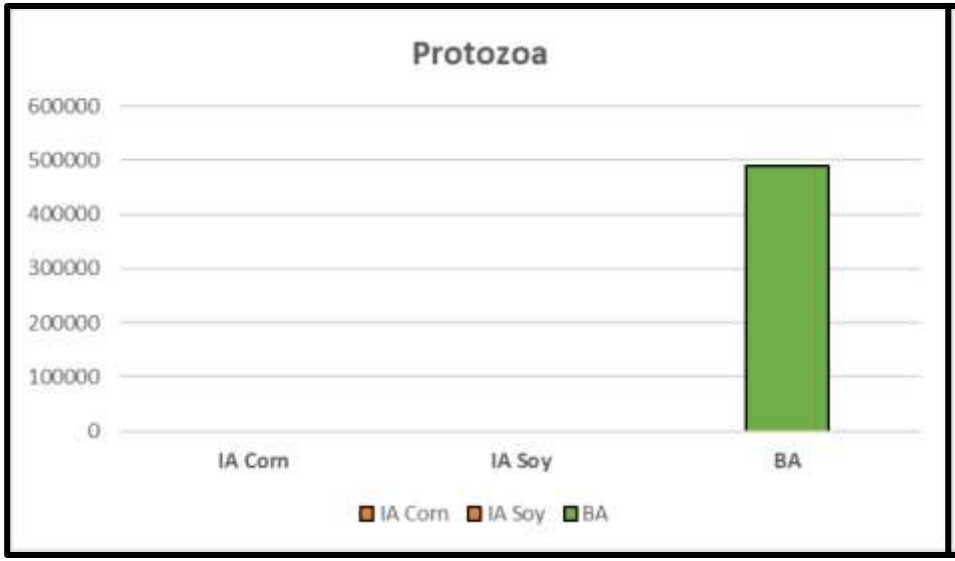
The Foundation--Microbiome

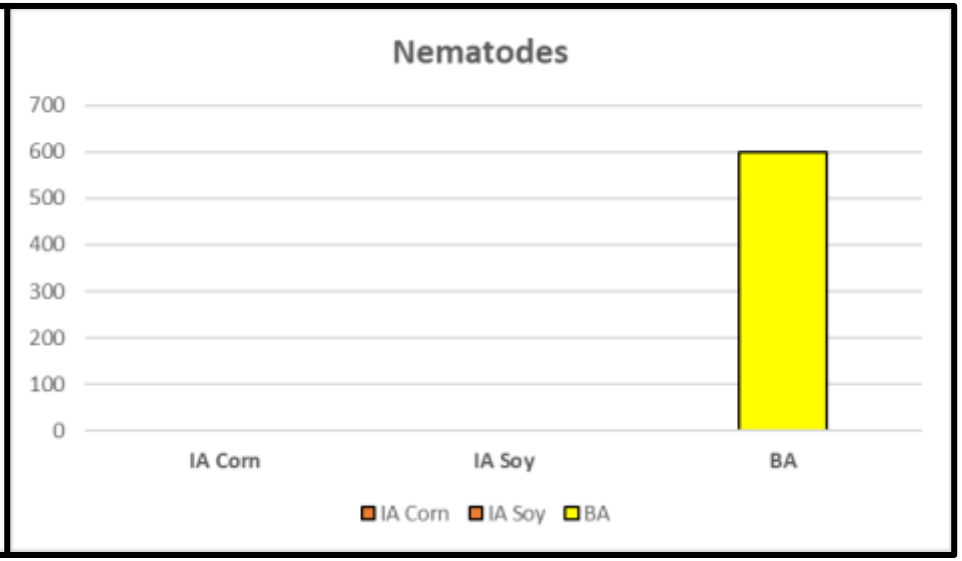


But, Dirt's Taking Over

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


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


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


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

REFILL
Roundup

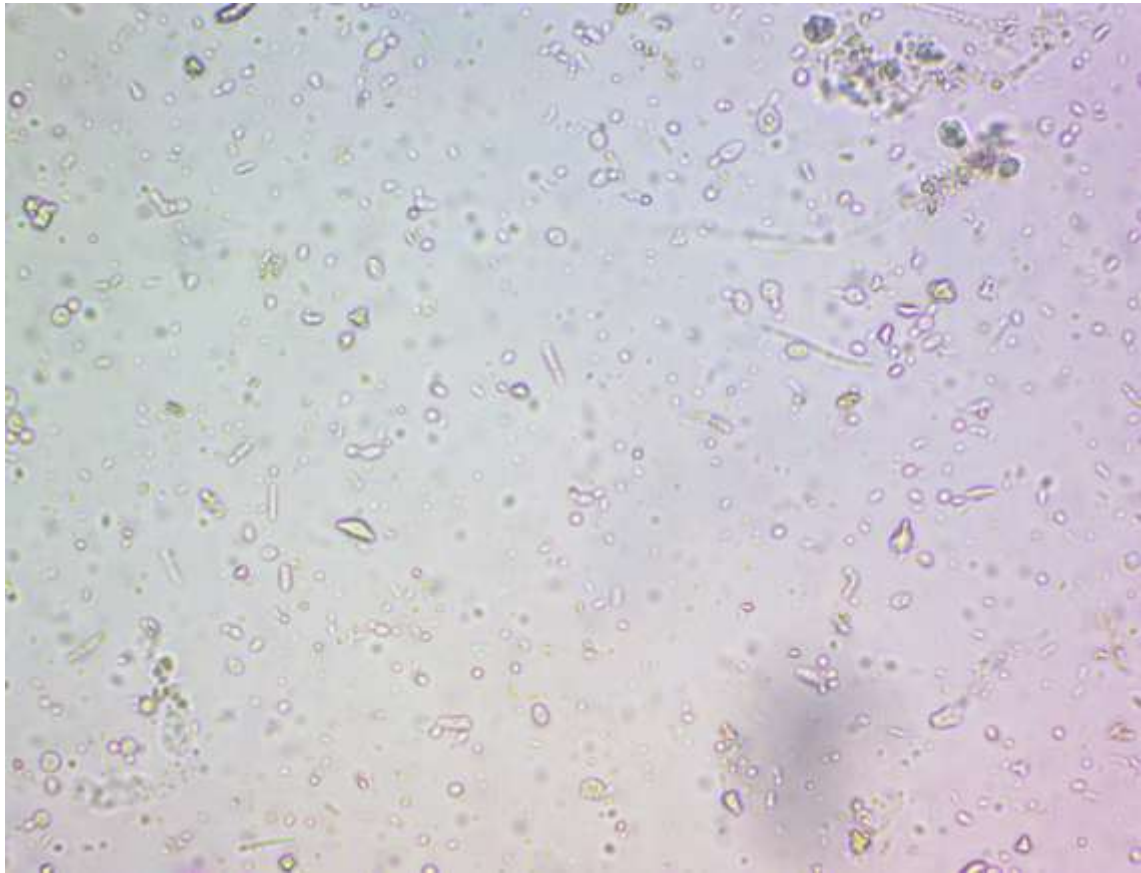
Wild Turkeys

Need

- Wild turkeys
- Air
- Water
- Food
- Comfort (Habitat)

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)

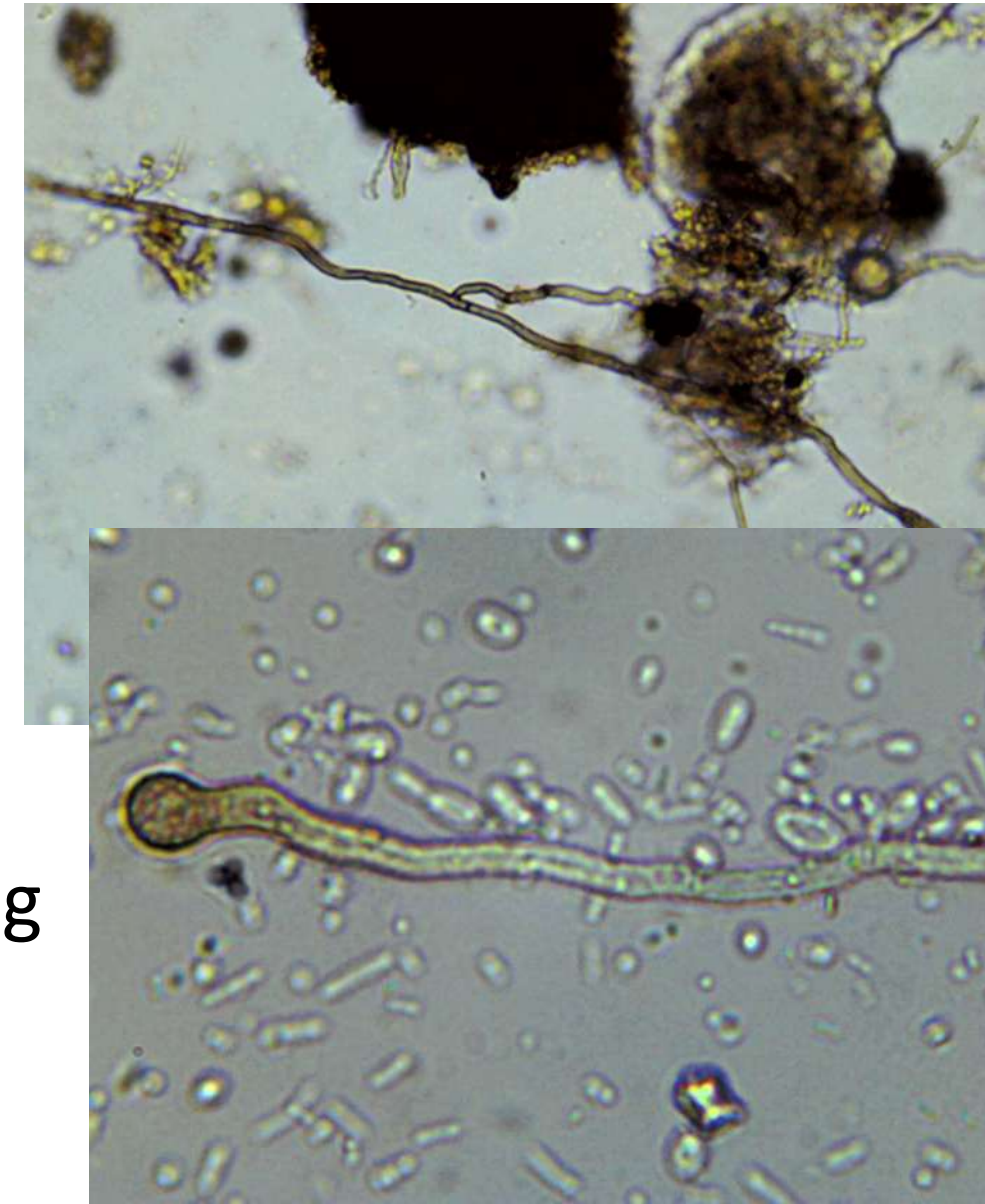
Photo Source: Israel Chemicals Limited Growing Solutions

Protozoa--Predator

Nematodes--Predator

Sources of Soil Microbes

- Raw Milk
- Manure
- Commercial Products
- “Pristine” Soil
- Worm Castings
- Compost
- Korean Natural Farming



Raw Milk

Farm Fresh South
RAW MILK
BETTER TASTE
BETTER HEALTH
BETTER PLANET
70,000
One
LITRE

Persistent Herbicides

- Corteva's Grazon® (Aminopyralid)
  - Broadleaf weed control in pasture
  - NC State Ext "Herbicide Carryover"

Hay—Facebook #1

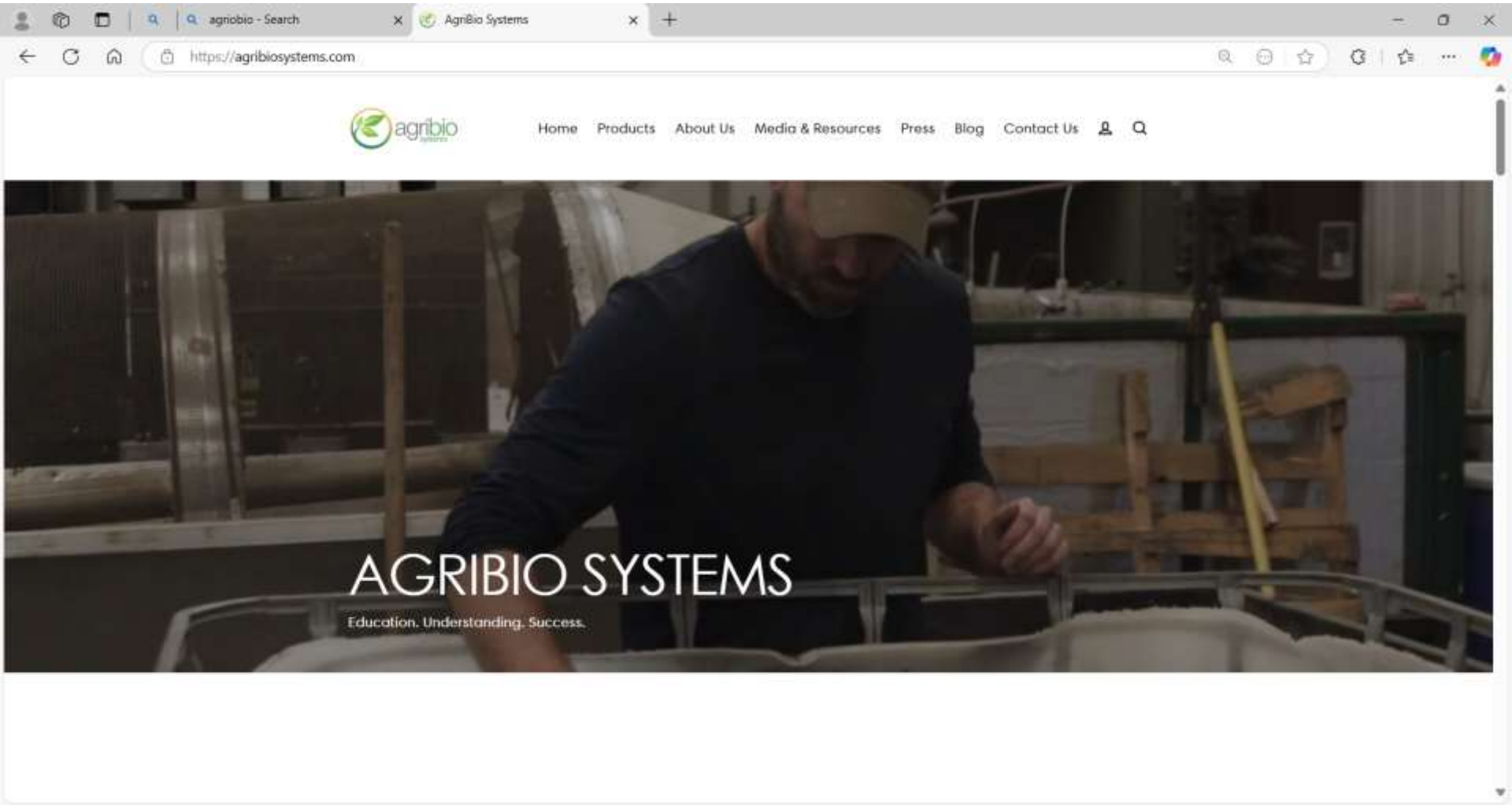
- “Good, clean grass hay sprayed for Weeds”
- $60/bale

Hay—Facebook #2

- “Not great quality Hay”
- $35/bale

Commercial—Worm Castings

Commercial--Agribio Systems



Agribio Extract

agribio illinois - Search | BioMax E - Concentrated Liquid

https://agribiosystems.com/products/biomax-e-concentrated-liquid-biology

agribio systems

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BIOMAX E - CONCENTRATED LIQUID BIOLOGY

$8.39

Size

1 Gallon | 2.5 Gallon | 275 Gallon

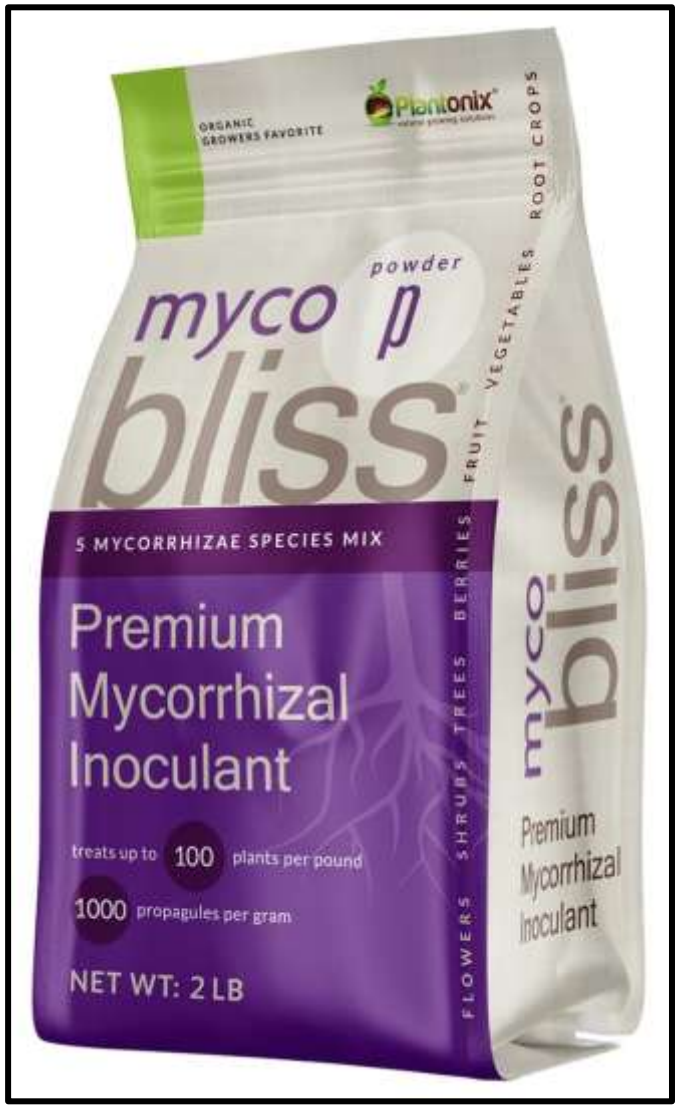
Quantity

1

Add to cart

Buy with shop Pay

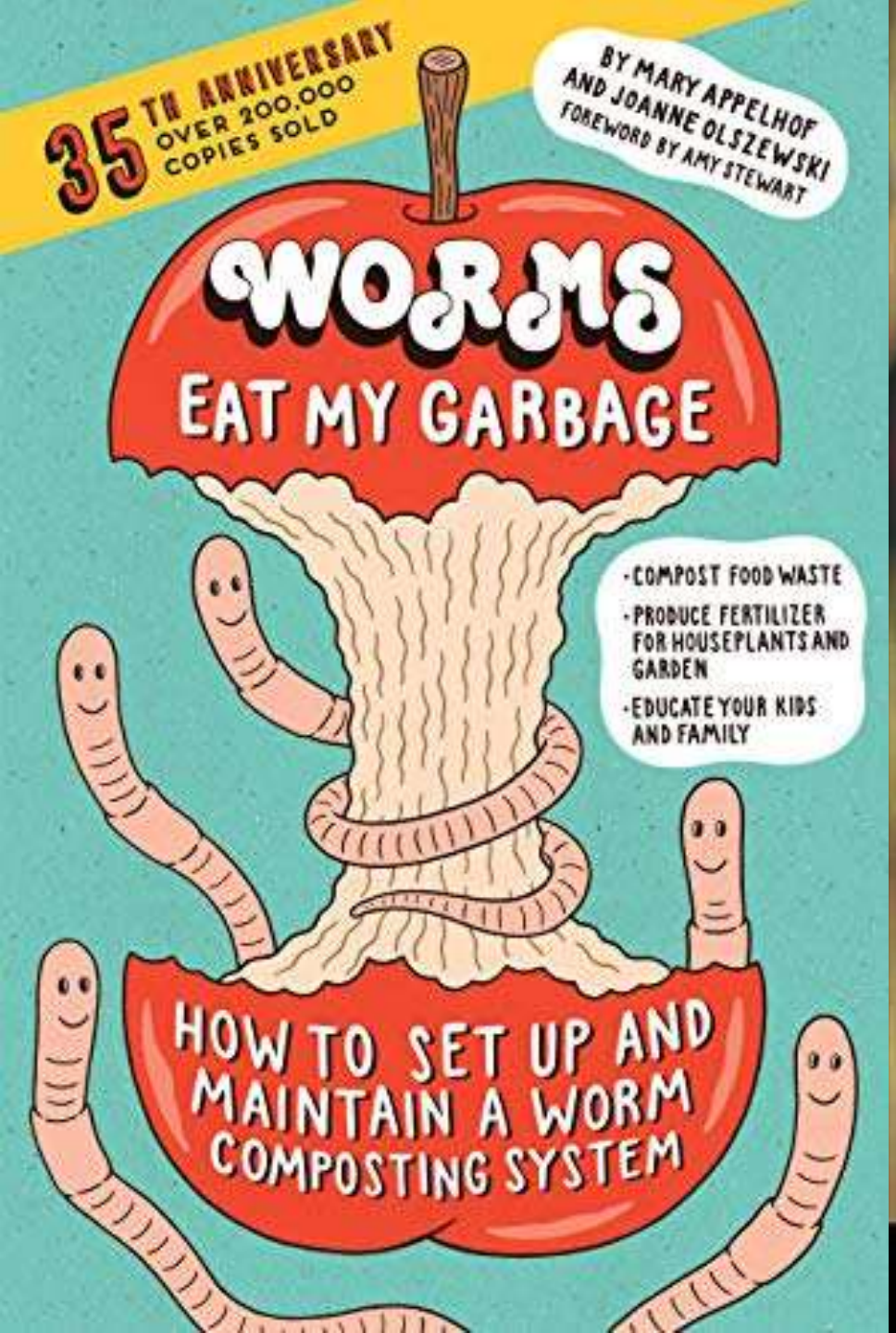
Mychorrhizae Fungal Spores

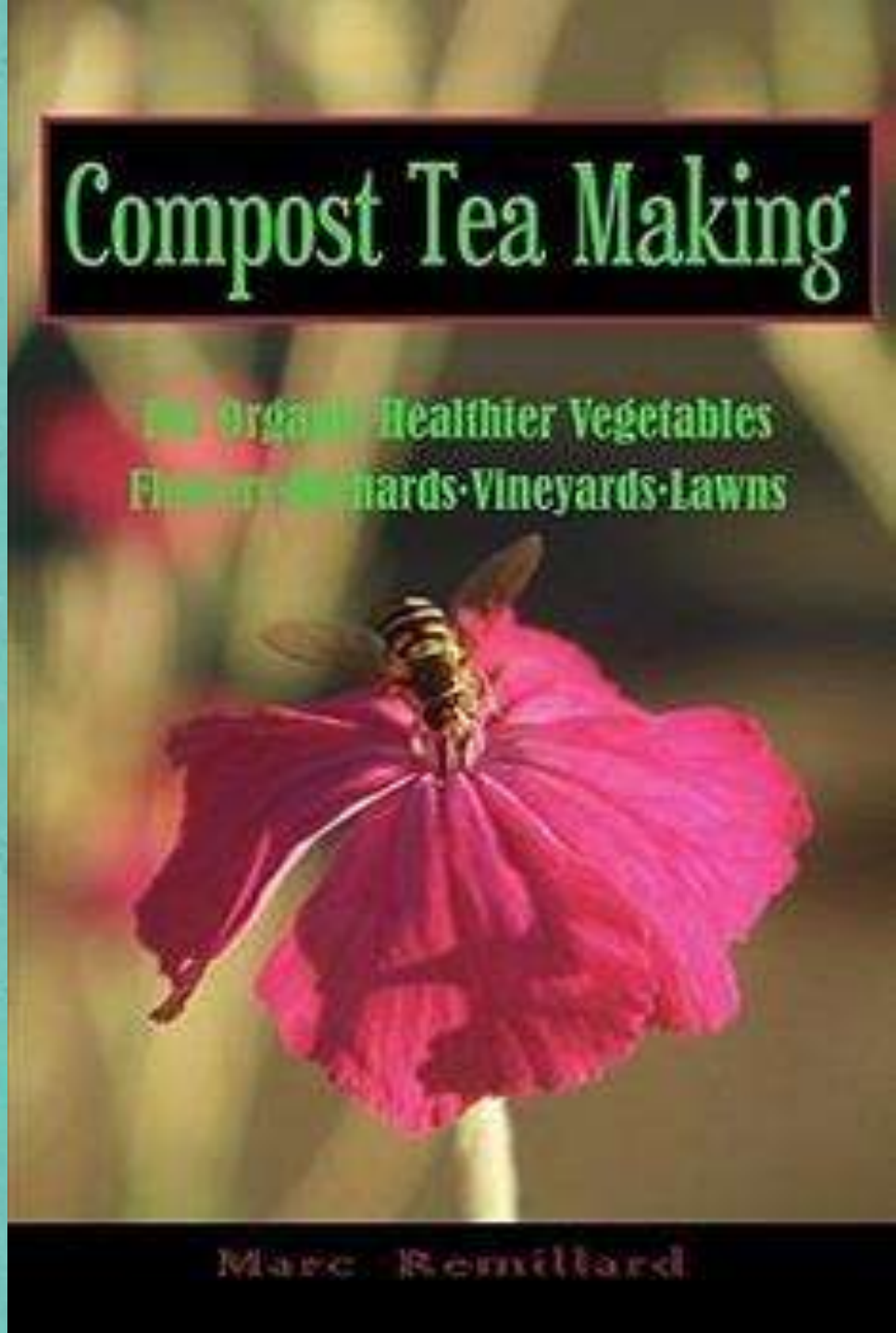


“Pristine” Soil

Worm Farm (Vermicompost)

- Red Wigglers (Eisenia fetida)
- Air & Water
- Food scraps, grass clippings, weeds, manure, etc
- Comfort--Worm bin & temp 40-120°F (85°F)


35TH ANNIVERSARY
OVER 200,000 COPIES SOLD
BY MARY APPELHOF AND JOANNE OLSZEWSKI
FOREWORD BY AMY STEWART
WORMS EAT MY GARBAGE
• COMPOST FOOD WASTE
• PRODUCE FERTILIZER FOR HOUSEPLANTS AND GARDEN
• EDUCATE YOUR KIDS AND FAMILY
HOW TO SET UP AND MAINTAIN A WORM COMPOSTING SYSTEM


Compost Tea Making
Healthier Vegetables
Vineyards·Lawns
Marc Remillard

10"x20.75"
I - 90
AND TRACE ELEMENTS

SEA-90
ERALS AND TRACE ELEMENTS

Worm Sifter

SEA-90

PERMA-R PRODUCTS, INC.
CAUTION!
open flame - combustible
Keep away from open flame
RESTROOM
DO IT RIGHT

FCMP Essential Living Worm Composter

Hiwassee Products

Wormpeople.com

- Capt Matt

- https://www.memesworms.com/
- https://unclejimswormfarm.com/

Nashville Client--Hydrangeas

What If We Brought Together?

- Bacteria & Fungi
  - Air
  - Water
  - Food
  - Comfort/right temperature
- COMPOST!!!

Different Types of Composting

- **Static**
- Thermophilic
- Dr David Johnson Bioreactor
- Korean Natural Farming

Static Compost (Not Heated)

Static Compost—Urban Style

Different Types of Composting

- Static
- **Thermophilic**
- Dr David Johnson Bioreactor
- Korean Natural Farming

Time & Temp Goals

- 131-150°F—72 hours
- 150-160°F—48 hours
- 160-165°F—24 hours
- 165-170°F—12 hours
- ≥170°F—Now

Where's "Heat" Come From?

- (Air/Water/Food/Comfort)
- Bacteria reproduce every 20 min
  - 1 to 2 in 20 min
  - 2 to 68.7 billion in 12 hours
- Fungal growth too

What Foods?

- Primary decomposers (Aerobic)
  - Bacteria
    - Less complex materials
    - Simple sugars, green grass, manure
  - Fungi
    - More complex materials
    - Leaves, wood chips, cardboard

Food Categories

1. Hi-Nitrogen “Hi-N” (C:N=5-15:1)
   - Manure, Alfalfa pellets
2. Green (C:N=20-30:1)
   - Hay, Grass clippings, weeds
3. Woody (C:N=60-400:1)
   - Wood chips, leaves, cardboard, paper, straw

WARNING: RISK OF FIRE
RISQUE D'INCENDIE

TROY-BILT
10HP CHIPPER SHREDDER
10 HP

TYPICAL RECIPE

- Hi-Nitrogen
  - Manure Cow, Chicken (15%)
- Green
  - Grass, Hay (35%)
- Woody
  - Leaves, Wood Chips, Cardboard (55%)

Different Types of Composting

- Static
- Thermophilic
- **Dr David Johnson Bioreactor**
- Korean Natural Farming

Johnson/Su Reactor

- Dr David Johson

KOBALT

TRUE TEMPER

Made in USA
11-05-21
PIPE-ASTM D-2729

Different Types of Composting

- Static
- Thermophilic
- Dr David Johnson Bioreactor
- **Korean Natural Farming**

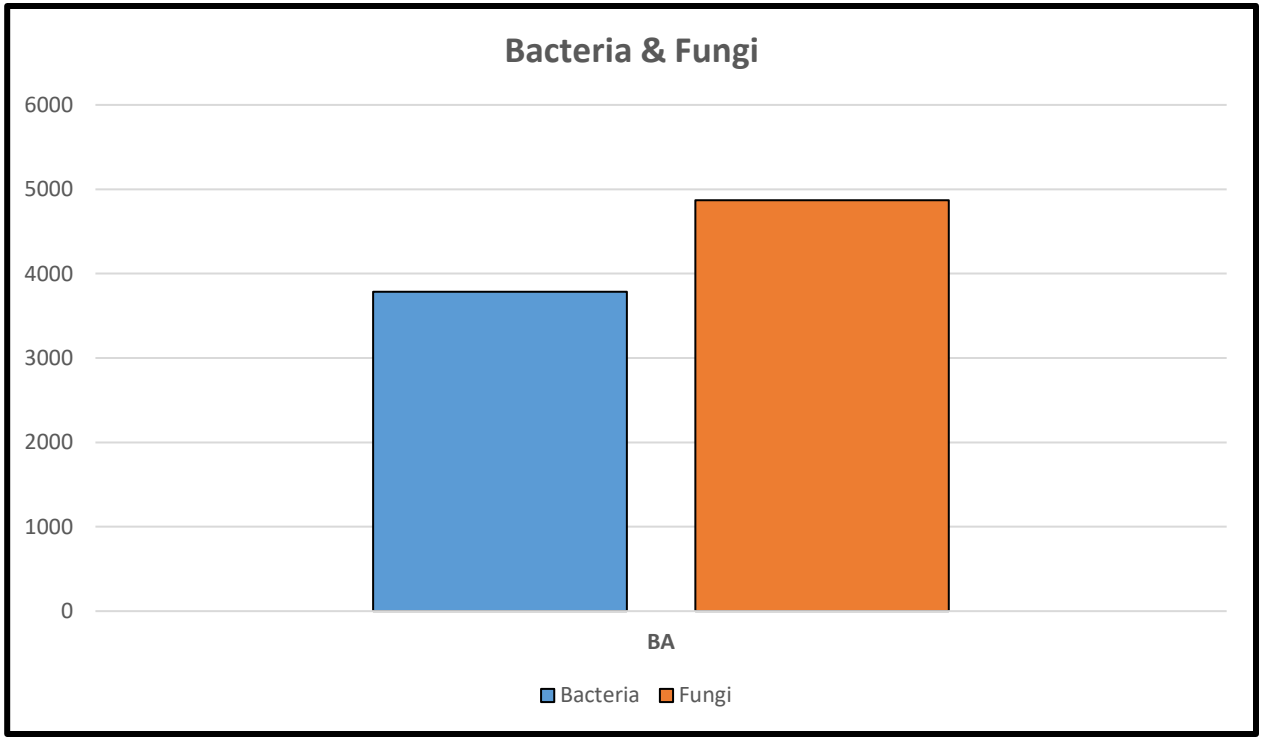
Korean Natural Farming

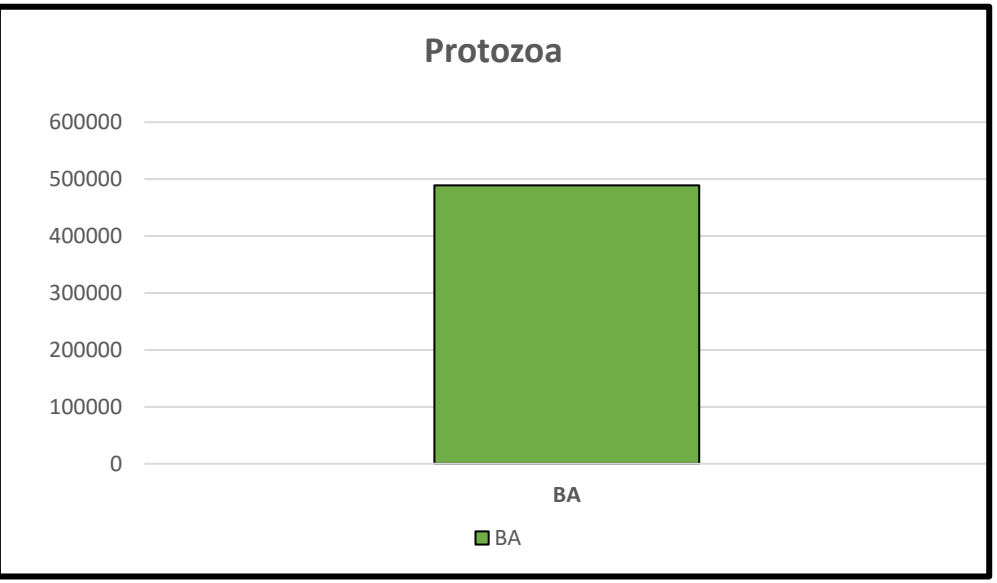
- Indigenous Microorganisms (IMO) 1

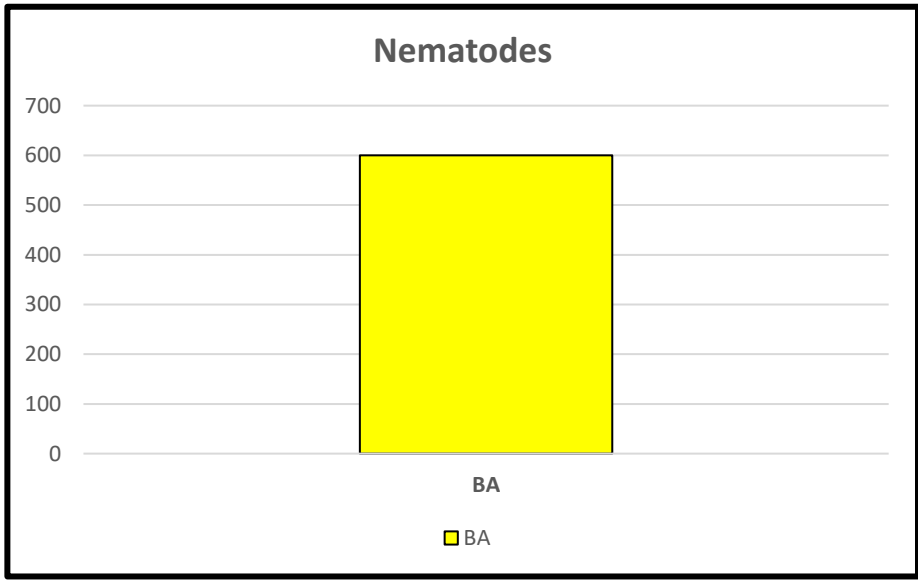
IMO2

KNF’s IMO 4

KNF Foliar Sprays


Bacteria & Fungi
6000
5000
4000
3000
2000
1000
0
BA
Bacteria
Fungi


Protozoa
600000
500000
400000
300000
200000
100000
0
BA
BA


Nematodes
700
600
500
400
300
200
100
0
BA
BA

Underwear Test

Three Forms of Biology

- Compost—solid
- Liquid Extract—simple liquid
  - Compost + water + agitation
- Compost Tea—“Brewed” liquid
  - Compost + air + water + food + 24-36 hours

Liquid Extract

MAYTAG

Compost Tea--“Activating Life”

- Compost
  - 2.38% compost, .5% molasses
  - (Tim Wilson @ https://microbeorganics.com/)
- Korean Natural Farming
  - IMO, Brown Sugar, ACV, FPJ, OHN, HA

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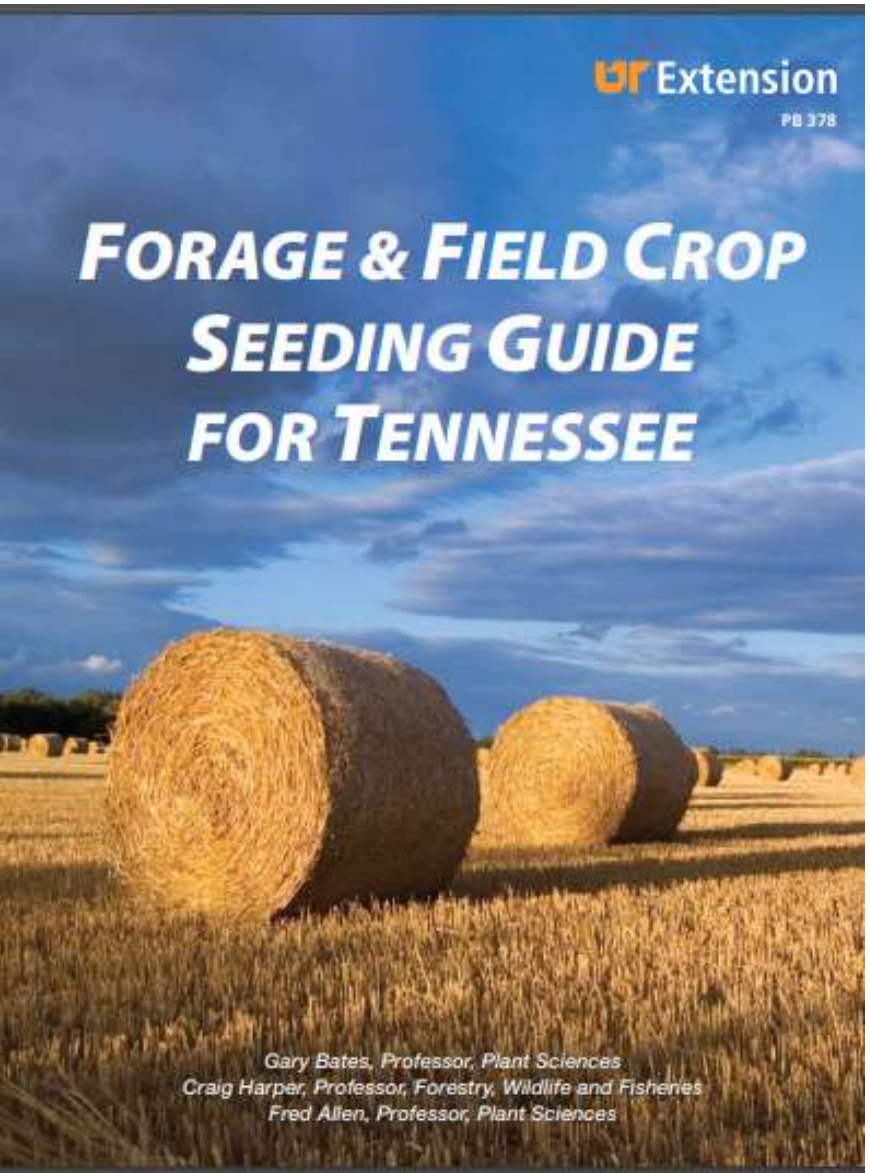
SUBS
KOSHER
PICKLE SPEAR

Microbe Habitat

Cover Plant Diversity



What If Mowed 24/7??

2025 “Living Soil” Classes

- Sep 6 & 20, 2025 (8:30 AM-4:00 PM)
- Liberty Trace Farm—Hampshire, TN
- Hands-on thermophilic, worms, farm tour, farm lunch
- Details: www.libertytracefarm.com

- Sign up: Libertytracefarm@gmail.com

THANK YOU!!!!!