Organic Grapes

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Missouri Winemaking Society
Terry Stromberg


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Why Organic

Some possible reasons

No chemical residues / non GMO
Taste
Nutrition
Better for the environment
    Air
    Water
    Wildlife
Self sufficiency
Higher market value

Organic Challenges

Plant diseases
- Fungal – Black rot, Phomopsis, Anthracnose, Downy mildew
- Bacterial – Crown gall

Insects – Japanese Beetles, Phylloxera, others
- Fewer options / no systemic products

Weeds
- No burn down options

Fertilizer
- Less choice, more expensive

Organic vs Conventional

A Continuum

Hydroponic

Green house

Conventional

Conventional with partial organic

Organic

Biodynamic

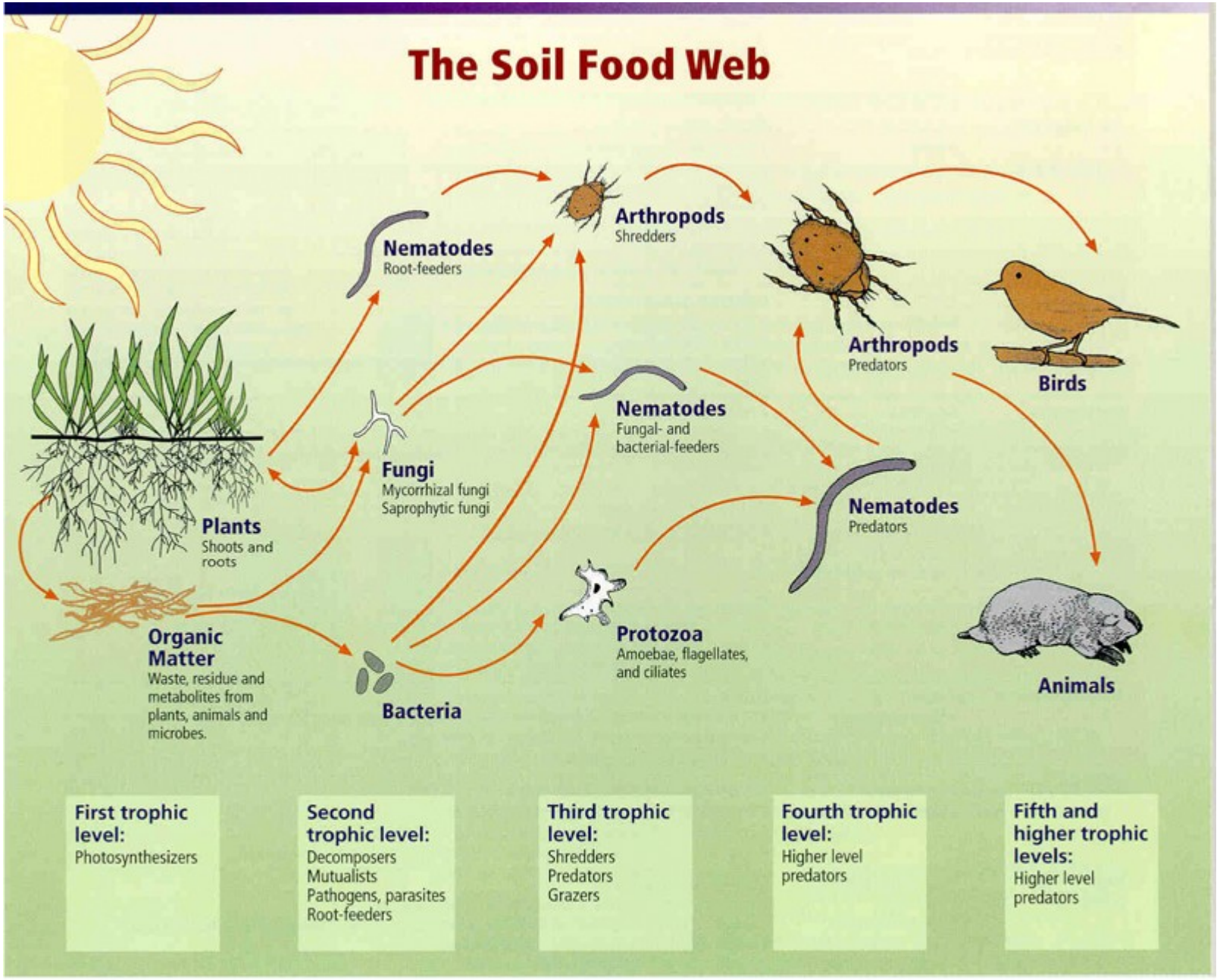
Variations in plant growth

- Nutritional levels vary greatly
  - Bionutrient Food Association (bionutrient.org)
- Disease susceptibility
- Variation with cultivars
- Soil types
- Soil biology
- Local weather
- Management practices
  - Fertilizer
  - Pruning
  - Water

My Approach

Enhance plant health

- Focus on the soil
- Plants have an immune system



Relationships between soil food web, plants, organic matter, and birds and mammals
Image courtesy of USDA Natural Resources Conservation Service
http://soils.usda.gov/sqi/soil_quality/soil_biology/soil_food_web.html.

Mycorrhizal Fungal Network

Source: Wikipedia

https://en.wikipedia.org/wiki/File:Mycorrhizal_network.svg

Plant Health pyramid

John Kempf Advancing Eco Agriculture

https://www.youtube.com/watch?v=D1wJefaFrVI&t=1s

Regenerative Agriculture
6 Principles of soil health

1. Minimize soil disturbance
2. Maximize diversity
3. Living roots
4. Armor the soil
5. Livestock integration
6. Context

Minimize Disturbance

Tilling soil disrupts fungal networks
- Mycorrhizal (connection between plants)
- Saprophytic (decompose woody material)

Chemical disturbance
- Most “cides” work by disrupting a chemical pathway
- This effects the soil food web as a whole not just the target pathagen (diversity loss)

Maximize Diversity

Jena Biodiversity Experiment

- Diverse plant life more productive than monoculture
- Large gain at 4 plant families

Living Roots

Plants exudates feed the soil food web
    Greater than 25% of total plant sugars

Soil food web (fungi) produces glomalin

Glomalin glues soil particles together producing aggregates
    Chocolate cake

Aggregated soil holds water and allows good air movement

No exudates if in a high soluble nutrient environment

Armor the Soil

Either mulch or living plants

Protects the microbiome from sun / high temperatures

Rainfall can compact soils

Livestock Integration

Studies show that adding livestock to a system increases productivity and increases soil organic mater

Ruminates the preferred choice

Rhizophagy Cycle Prof James White Rutgers

https://www.youtube.com/watch?v=yMr3_tGeAu8&t=1s

Redox graphs

Dr. Olivier Husson

https://www.senseen.io/blog

Measuring plant stress Husson Agroecology webinar 2021 05 19.pdf

Organic vs Conventional

Conventional <-	Differences	-> Organic
Chemistry		Biology
Soluble nutrients		Microbes
Clean		Messy
Mono culture		Diversity
Address specific issues		Enhance overall health

Integrating Sheep into a vineyard

Kelly Mulville @ Piacines Ranch Vineyard

https://www.youtube.com/watch?v=yMr3_tGeAu8&t=1s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05 22 2017

Future Options

Soil Testing

Haney Test – measures biological activity

Plant Testing

SAP Analysis – measures essential nutrients
current state vs tissue analysis

Handheld Meters (spectrometer)

Senseen Scanner – pH, eH, EC, BRIX
Near-infrared 850 – 2500 nm

Bionutrient Meter – Nutrient density
10 frequencies VIS - NIR