



# **Waterfall Produce** (Troy Blackman)

**Soil health and how it relates to sustainable, organic farming.**



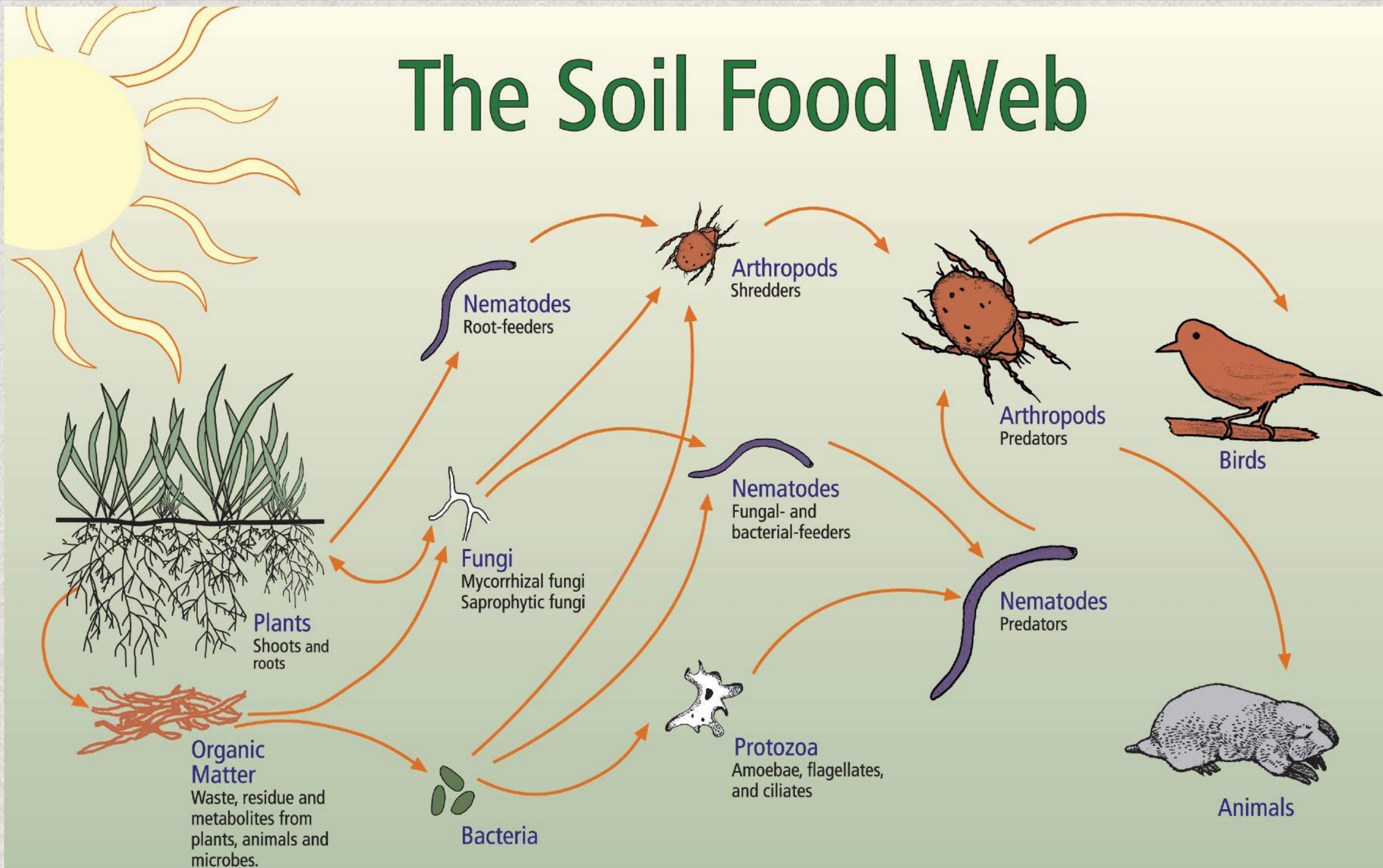


# SUSTAINABILITY

ENVIRONMENT, PUBLIC HEALTH, COMMUNITY, ANIMAL WELFARE.



# 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



# How does soil function?

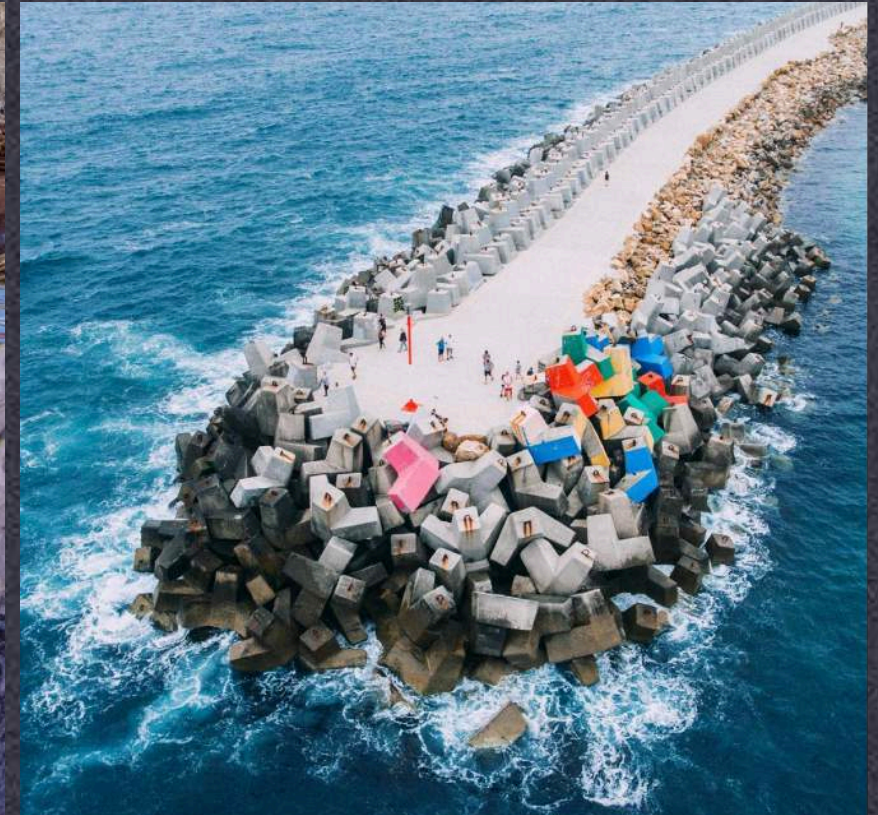
The microbiological community of the soil should be complex, diverse, balanced, redundant, and include bacteria, fungi, actinobacteria, protozoa, nematodes, arthropods, earthworms, and many others.

A healthy soil should perform the basic roles of water cycling, nutrient cycling, and physical support. Soil managed as biological habitat will create and maintain stable soil aggregates (dense network) and allow water to infiltrate and permeate the soil,

Soil aggregates are built by soil microorganisms and plants, not by tillage. Tillage can only degrade and disintegrate soil aggregates. Tillage induced aerobic erosion of soil organic matter results in the loss of the most fragile fraction of soil organic matter, the organic glues that keep soil aggregates water stable.

It helps to think of these parts in a similar way to a food web. Plant being eaten by animal, then larger animal eating that animal and so on.







# Nutrient Cycling

In most present-day agricultural systems, primary crop nutrients are supplied from outside sources in various synthetic and natural forms.

Once we recognize soil organisms as the drivers of soil health, we understand that the most important element in soil nutrient cycling is not nitrogen, phosphorous or potassium, but carbon. Carbon is the currency of the soil.

It feeds the organisms that comprise the soil food web so they can fix, decompose, acquire, and cycle essential plant nutrients. Carbon enters the soil economy through plants or other photosynthesizing organisms that possess chlorophyll.

Blooms of algae, dead zones in surface waters, and nitrate pollution of groundwater, are caused primarily by the mistaken belief that the soil is exclusively a physical and chemical system. As opposed to a dense network of living organisms.



# Roles they play!

Soil organisms control the pH and availability of nutrients in the soil and work in concert with plants to protect and supply the roots with these nutrients.

They use moisture in the soil as a pathway to deliver nutrients to the roots of the plants.

Much of modern agronomy is focused on feeding plants the nutrients they need to grow and produce a harvestable crop.

It is not for lack of these nutrients in the soil that plants suffer nutrient deficiencies, but instead it is a lack of available nutrients and water. Meaning the soils ability to give the plant the nutrients it needs.

Feeding the plant directly not only reduces soil aggregates (dense network) but it teaches the plant to rely on inputs from above instead of signalling to microbes below to deliver it.

In this method plants can get addicted to synthetic fertiliser.



# So what can i do?

The easiest source of food for soil microbes is the sugar exuded through the roots of living plants. The next easiest food source is dead plant roots.

Keeping consistent cover over paddocks with active hummus is crucial. This layer acts as a buffer and allows the carbon from dead plants to be absorbed into the soil.

You can feed energy sources to the hummus through compost tea and compost applications as well as introducing increasingly larger numbers of microbes into the soil network where they may be lacking.

In soil where the soil food web network is lacking the plant can expel excess (wasted) exudates in order to compensate for the lack of diversity in the soil below.

This whole system can quickly become a deep negative feedback loop.



# Changing Focus!

Very few farming enterprises have deep enough pockets to fight this natural way the soil operates year after year in order to achieve adequate yields in pasture and cropping.

Changing the focus from feeding the plant minerals to feeding the life in the soil can save a whole lot of time and money.

Starting to see that all the things we are “up against” as farmers are merely a symptom of an unhealthy soil food web network.

Its nature's way of recorrecting itself.

Things such as “weeds” are a classic example of this, and show why herbicides are merely a bandaid solution to what is actually a soil health issue.



# Simple ways to build your soil food web!

- Operate from a place of soil health and building SFW not feeding the plant.
- Increase microbial numbers through compost teas and compost spreading.
- Increase the communication between plant and soil through feeding the hummus.
- introduce legume crops that through rhizobia bacteria capture nitrogen from the air at a low C:N rate.
- Manage stock holistically, large numbers, small areas, moved often.
- Diversity in pasture. Roots at different depths keeping moisture and the SFW functional at varying depths (resilience)
- less soil disturbance (use innovating technology to achieve similar goals. )



## REFERENCE PRODUCTS

### CATTLE HEALTH ITEMS:

- AC CATTLE COAT (BUFFALO FLY, TICKS, FLIES, MITES, LICE)
- MEGA MIN MINERAL LICK BLOCKS
- ULTRA VAC 7 IN 1

### COMPOST TEA INGREDIENTS:

**BLACK STRAP MOLASSES**

**FISH HYDROLYSATE**

**HUMID ACID**

**DENSE COMPOST**

**VERMICAST**

### REFERENCE COMPANIES

**AG SOLUTIONS**

**SOFT AGRICULTURE**

**BIOMASS SOLUTIONS**





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