Jersey-Friendly Yards
Landscaping for a Healthy Environment

Start with Healthy Soil

Don't Treat Your Soil Like Dirt!

Presented by,
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Healthy Landscapes Consulting

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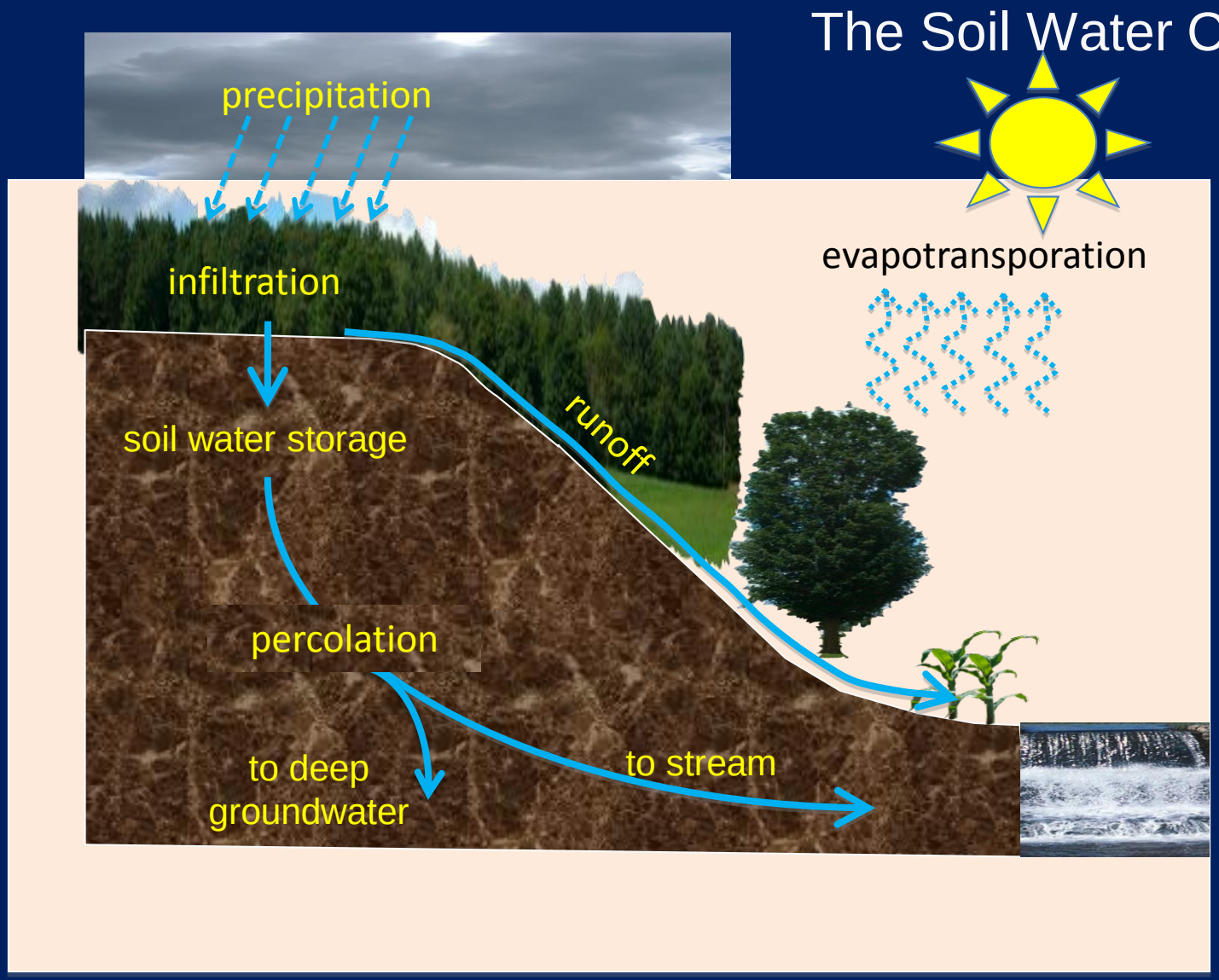
Ocean County College

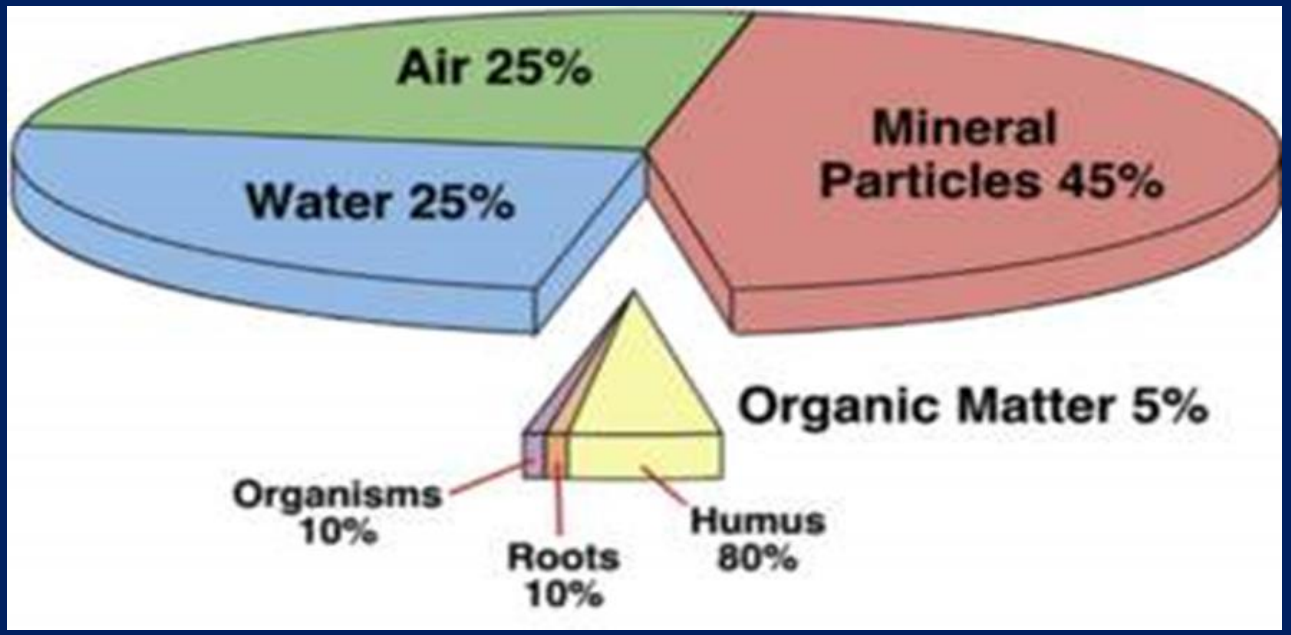
Soil is the Basis of the Ecosystem



What is soil?

- Soil is a living, dynamic resource that supports plant life. It's made up of different size mineral particles (sand, silt, clay), organic matter, and numerous species of living organisms.

- Soil has biological, chemical, and physical properties that are always changing.



What is Soil Health?

Soil health is defined as

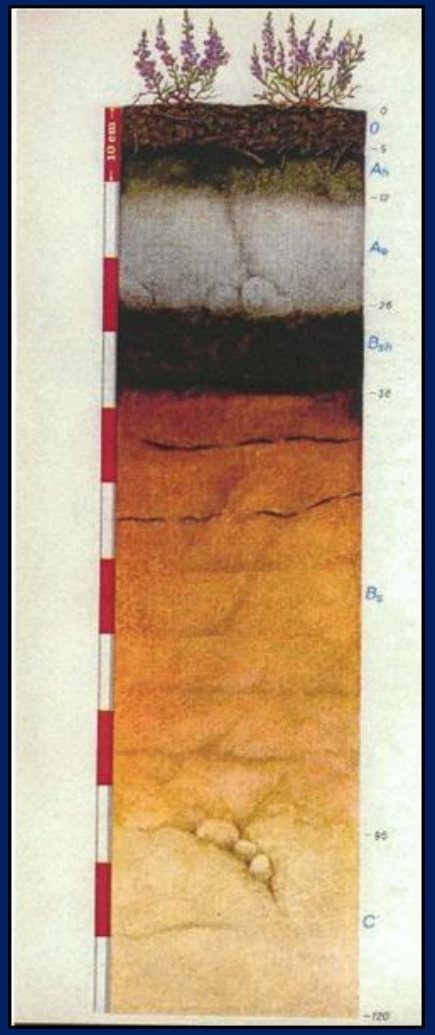
"***the capacity of a soil to function within ecosystem boundaries to sustain biological productivity, maintain environmental health, and promote plant and animal health.***"

Get to know your soil

Soil Properties

<u>Inherent-</u> what the soil is born with through soil formation. (texture, depth to bedrock)

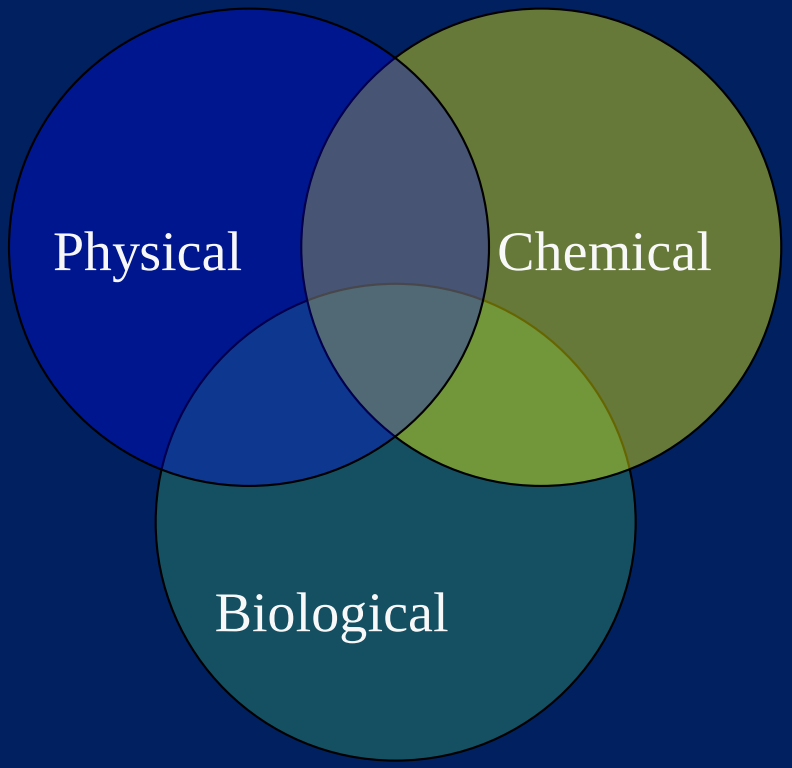
<u>Dynamic</u>- human induced changes- Use and Management



Soil Health Assessment-

- Visual observations
- Soil Quality/Health Cards
- Infield-Assessments (SQTK)
- Laboratory Assessments

What makes a Soil Healthy?



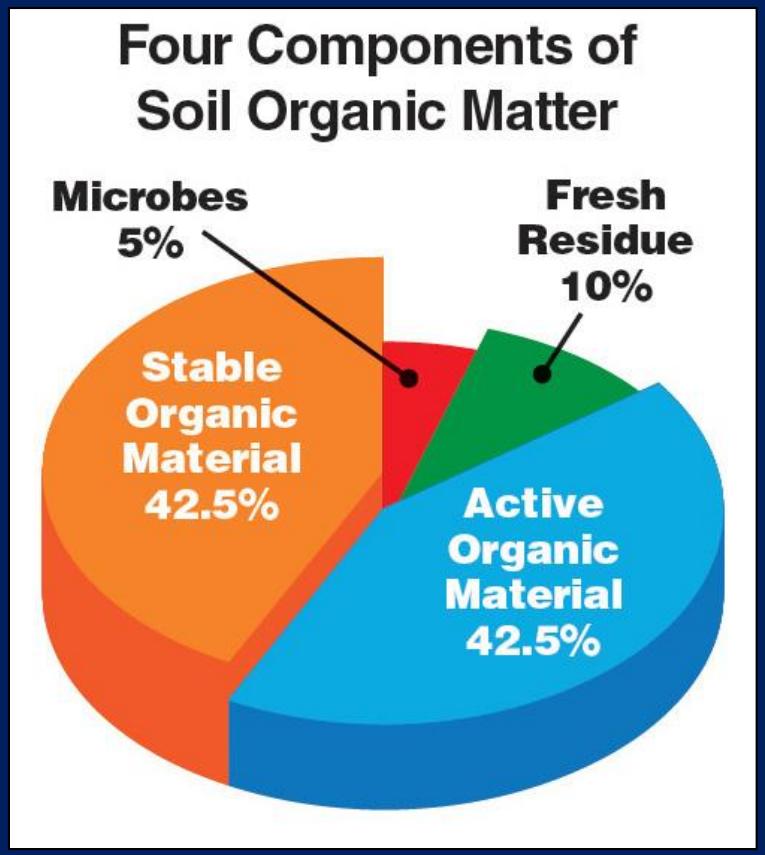
It is the integration of the physical, chemical and biological worlds that produces a healthy soil ecosystem.

Soil has biological, chemical, and physical properties that are always changing.

Soil Organic Matter

Is necessary for all soil functions, and it is the most important

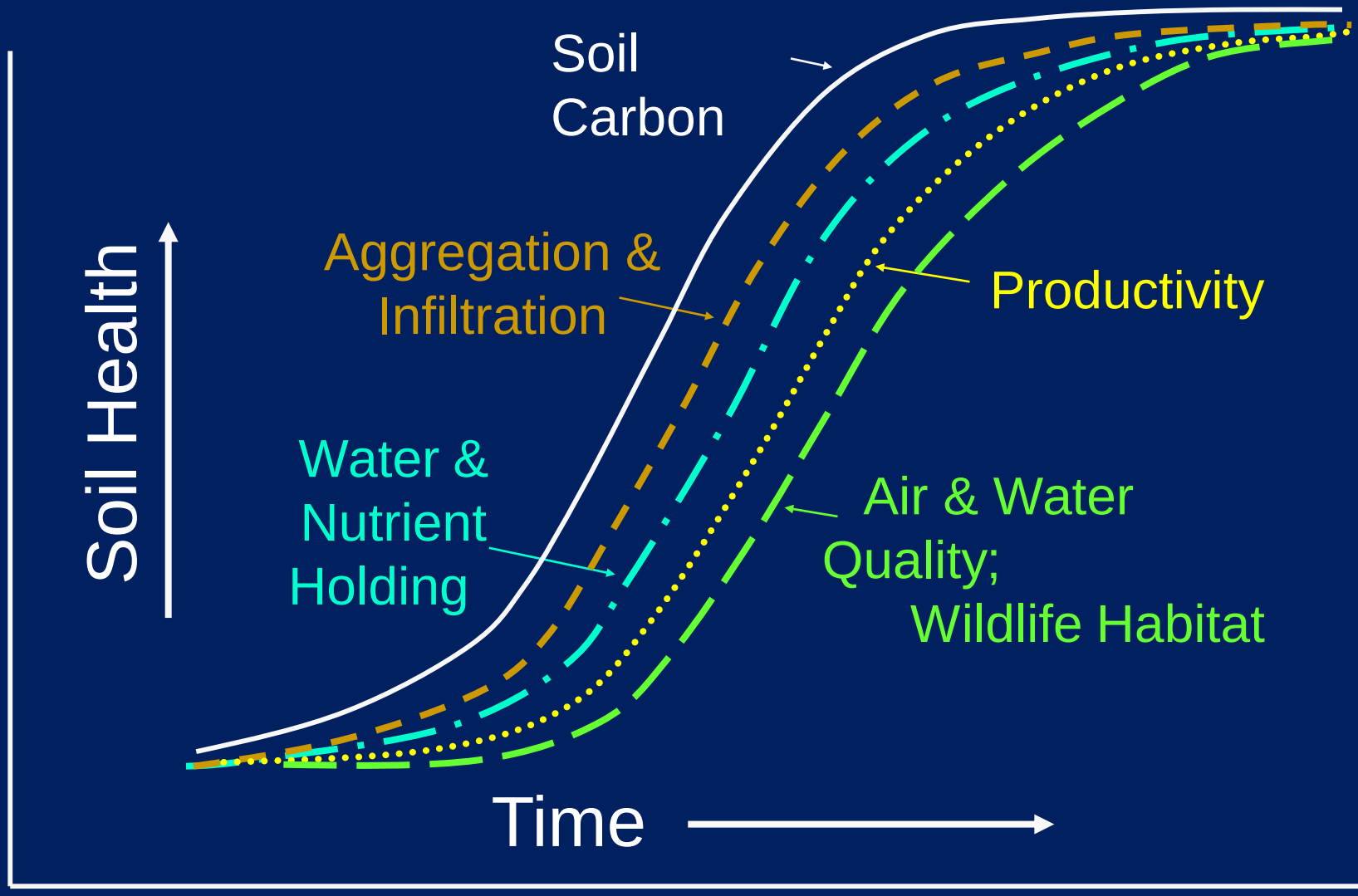
indicator of soil health.



Organic Matter Benefits

- Biological-food and shelter for soil microbes.
- Physical-pore space, aggregation
- Chemical-nutrient exchanges
- Improved soil structure
- Increased infiltration & water holding capacity
- Increased CEC-soil acts as bank for + charged plant nutrients

Benefits of Soil Carbon



Organic Matter & Water Holding Capacity

- Organic matter holds 18-25 times its weight in water
- Every 1% of organic matter can hold 27,000 gallons of water per acre

Soil Health and PHYSICAL Processes

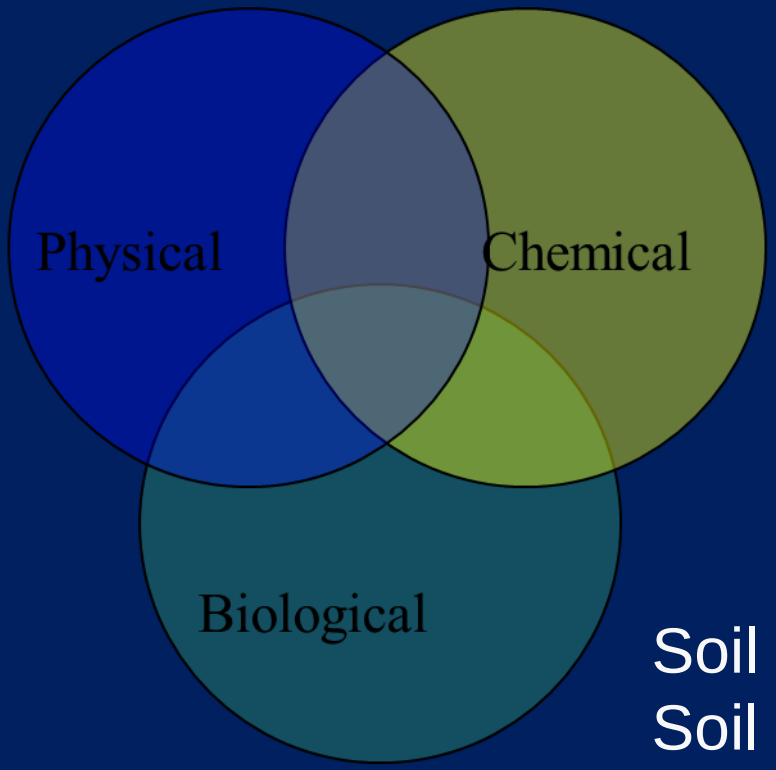
Physical support for plants

Aeration

Soil water storage and movement

Resistance to soil erosion

Physical root proliferation and organism movement



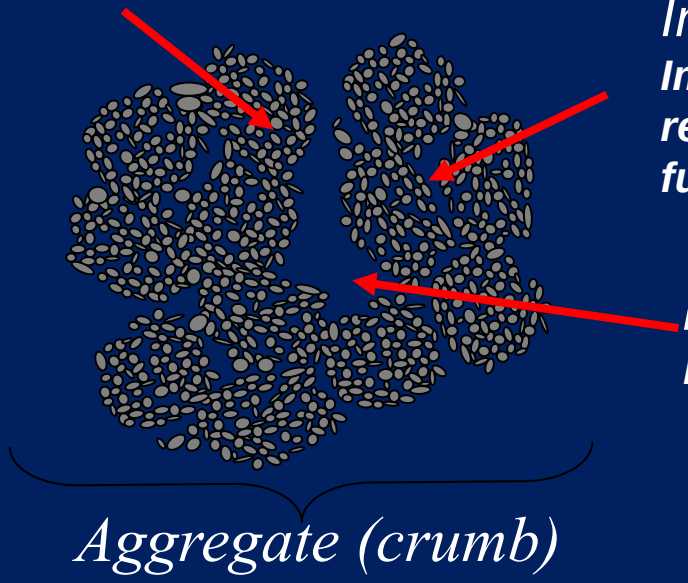
Soil Texture
Soil Structure
Soil Color
Bulk Density

What is Soil Structure?

Sand, silt and clay particles combine with one anther to form cluster called aggregates. The way in which aggregates or clusters are arranged is referred to as soil structure.

Aggregate Stability

*small pore – **important for long term moisture retention***



Intermediate pore-
Important for water retention and biological functions

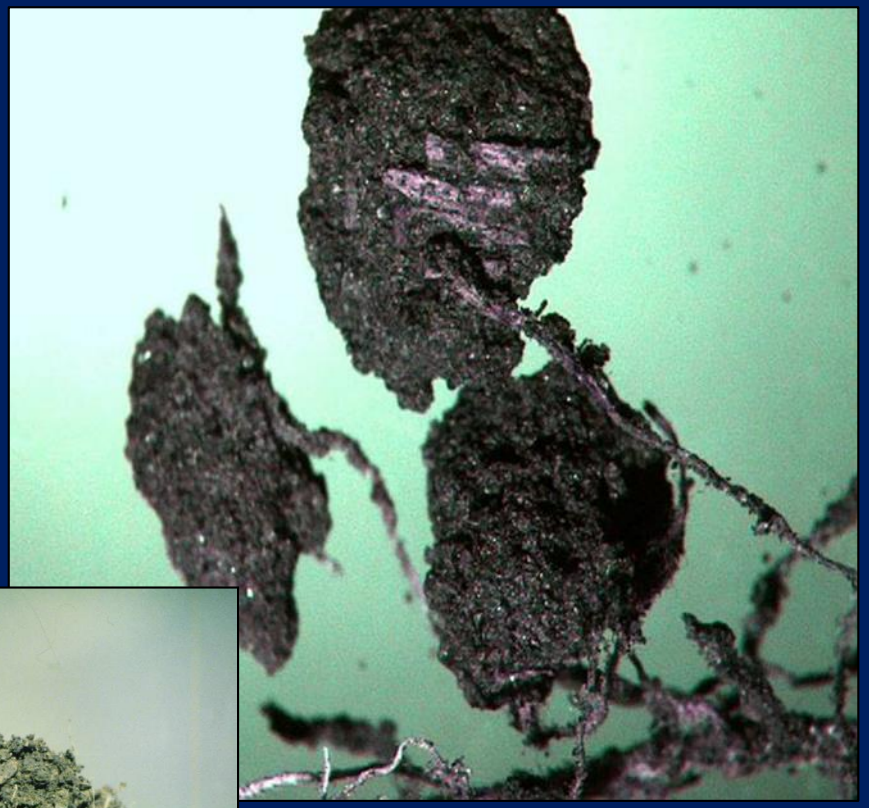
large pore –
Important for drainage, aeration and rooting

The way in which aggregates or clusters are arranged is referred to as ***soil structure.***

A well aggregated soil has a range of pore sizes.

Factors Influencing Aggregate Stability

- Organic Matter content
- Clay Content
- Tillage
- Texture
- Microbial Populations
- Plant Diversity



Slake Test Demo

Soil Color

- Indicator of different soil types
- Indicator of certain physical and chemical characteristics
- Due to humus content and chemical nature of the iron compounds present in the soil

Bulk Density/Compaction

Is Rainwater Infiltrating into the soil or ponding?

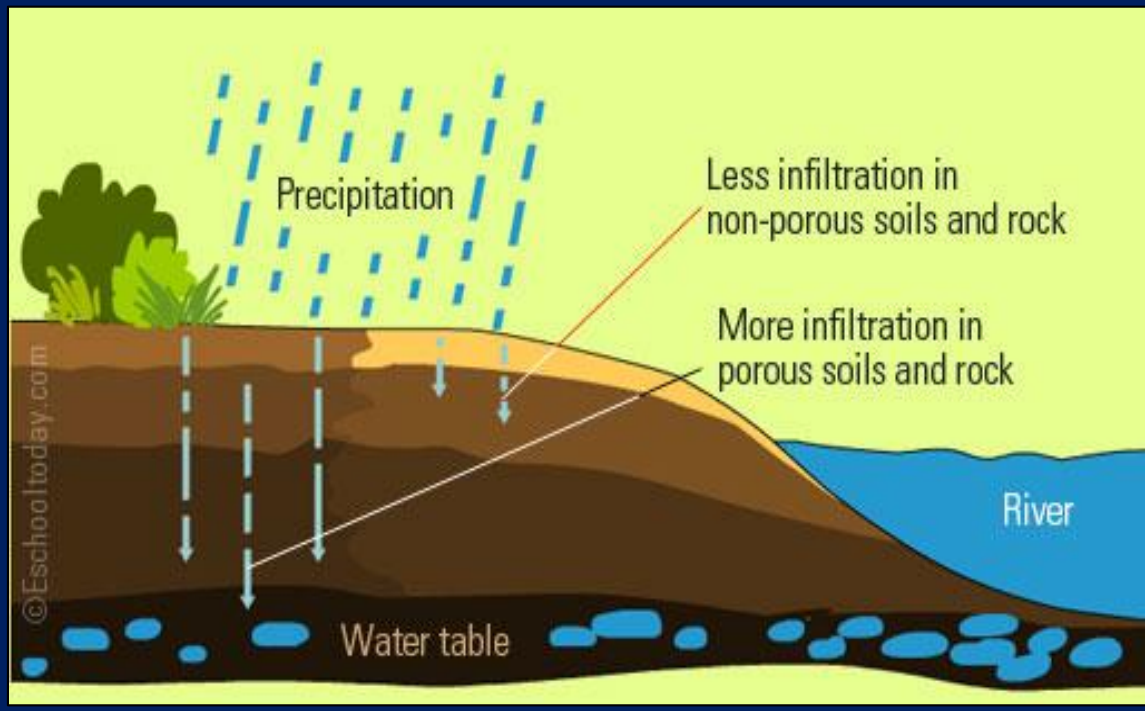
Keep it Loose – Avoid Compaction.

Visual Observation

- Color
- Structure
- Porosity
- Root density

Factors Affecting Infiltration

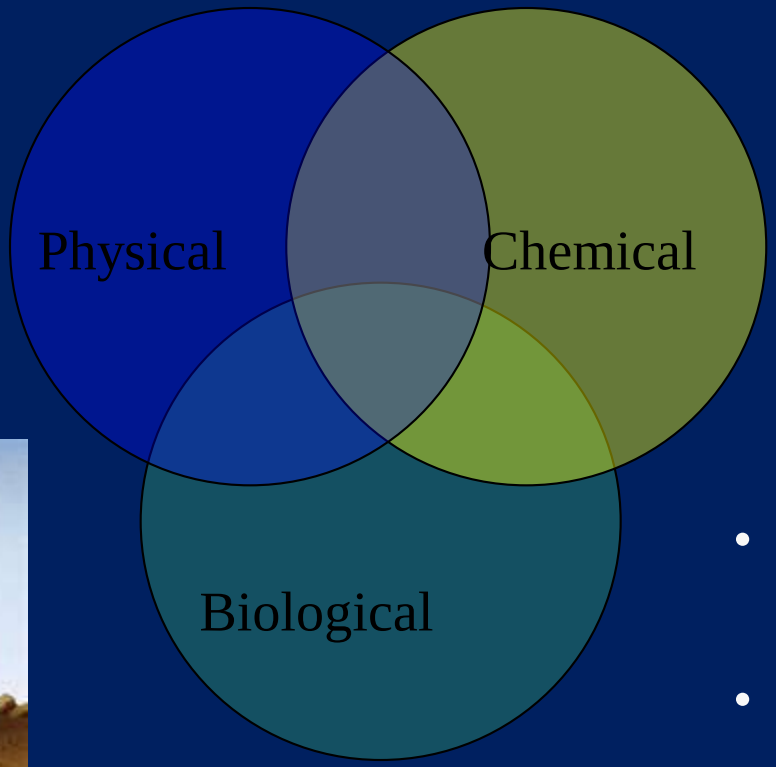
- Soil Type
- Aggregation/Crusting/ Sealing
- Surface Storage Capacity
- Plant Canopies
- Surface Cover and Mulch
- Soil Freezing
- Hydrophobicity

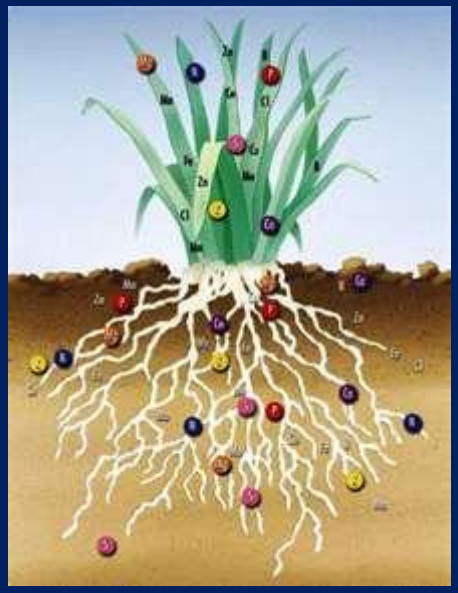


Surface Sealing and Crusting

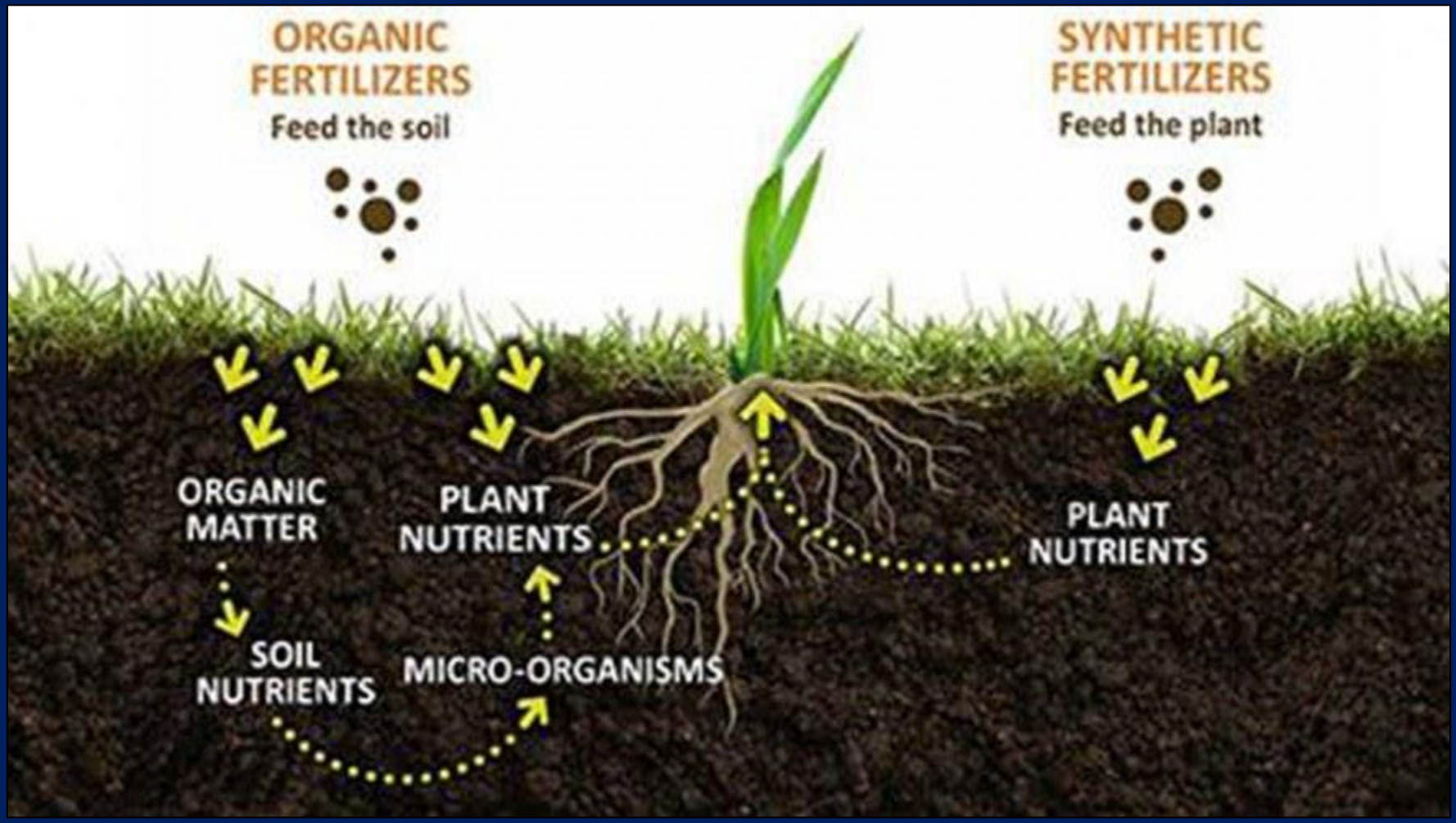
Crusting is a symptom of the breakdown of soil structure that develops especially with intensively and clean-tilled soils

Soil Health and CHEMICAL Processes



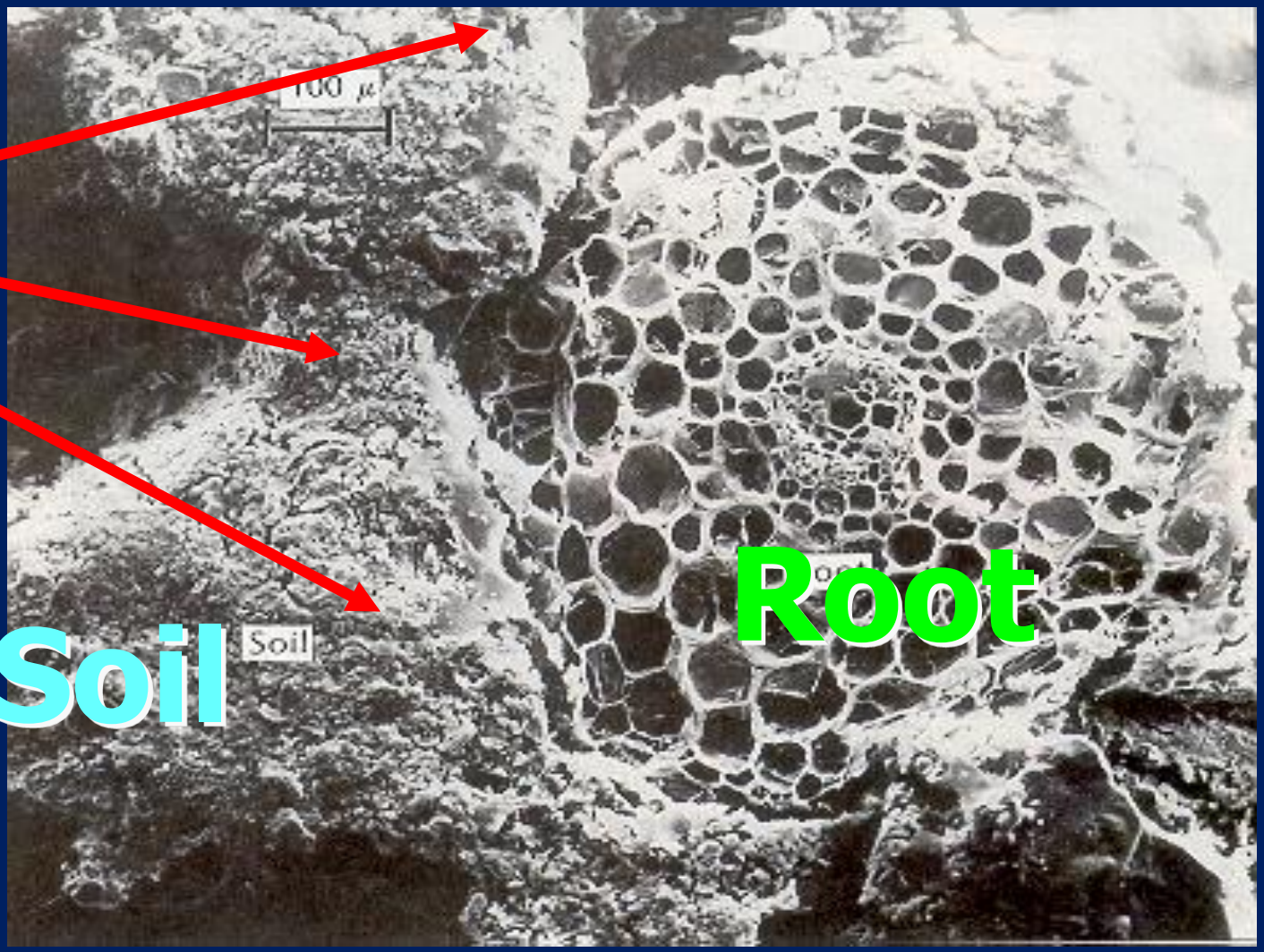


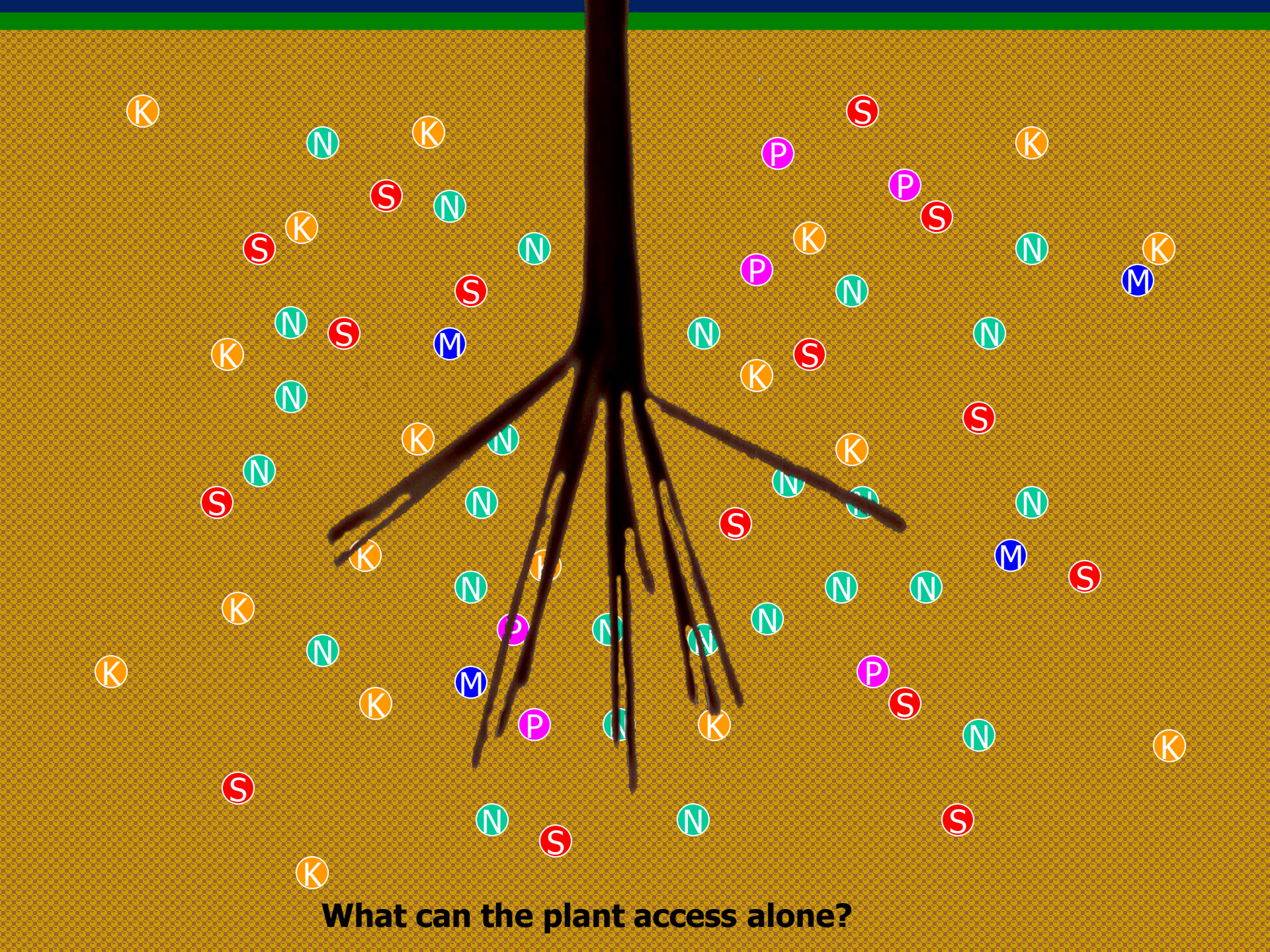
- Nutrient storage and release
- Soil reactions
- Energy (C) storage



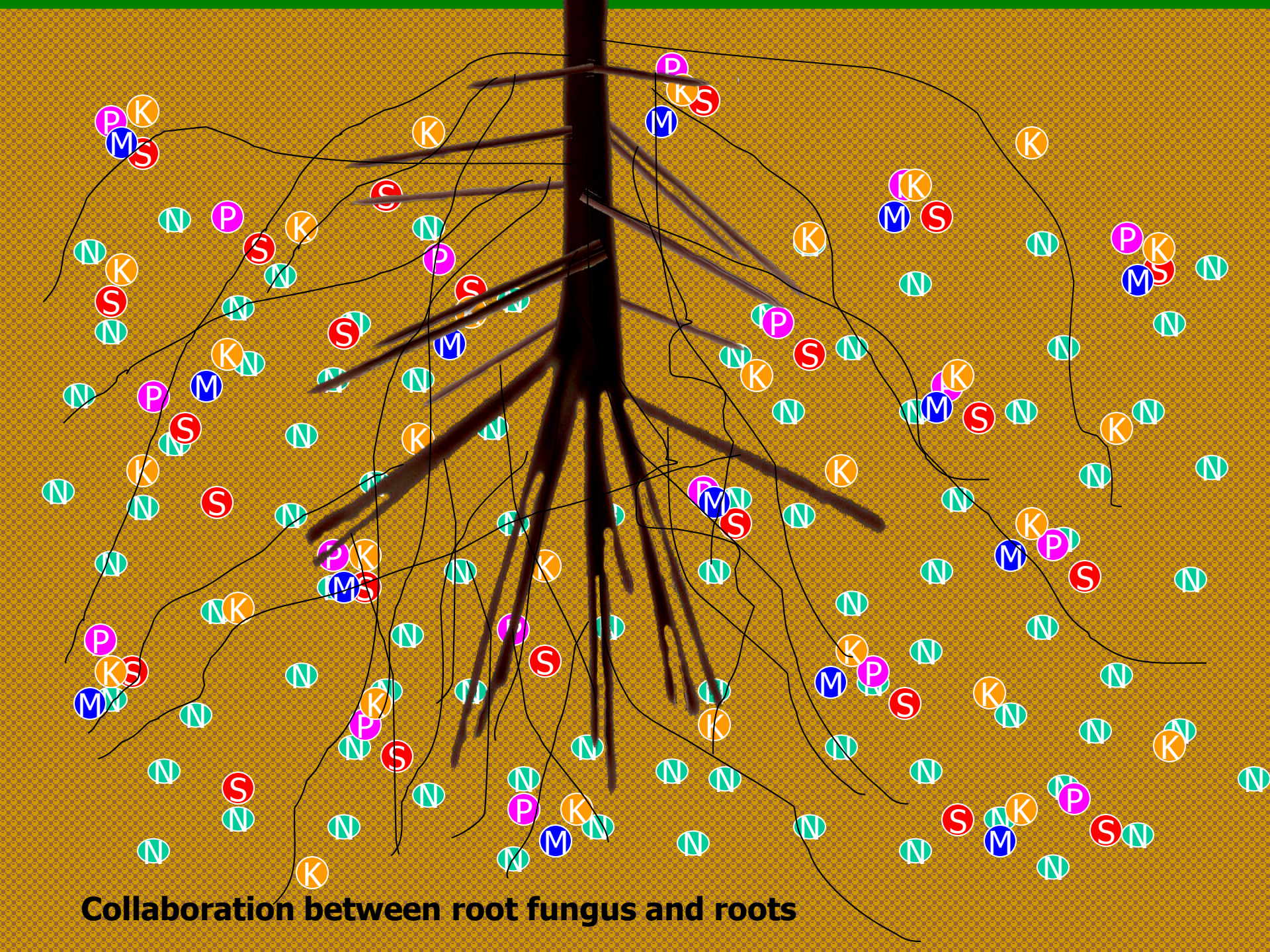
Organic VS Synthetic Fertilizers

Rhizosphere





What can the plant access alone?

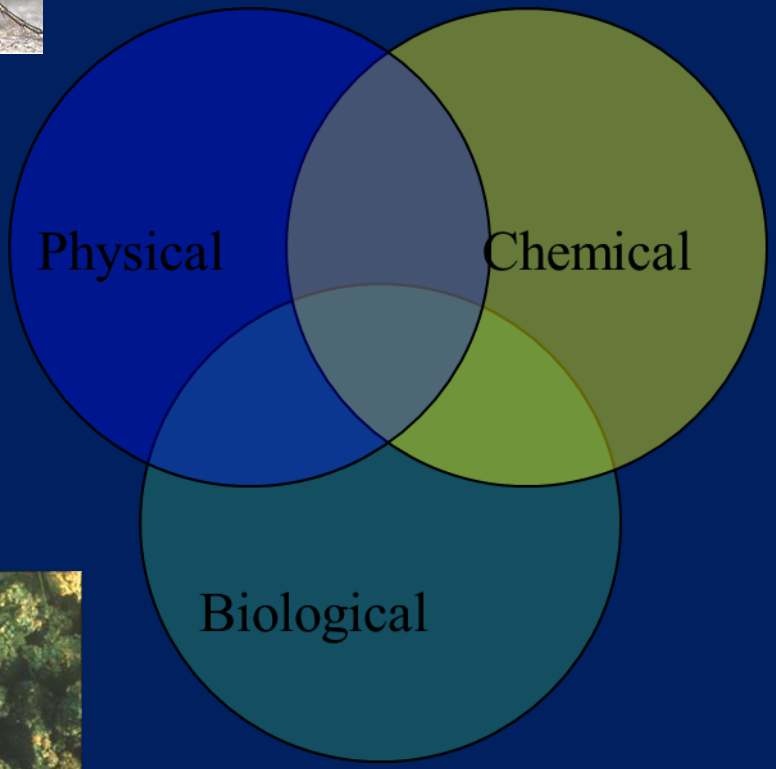

Collaboration between root fungus and roots

Lab Assessments- Don't Guess, Soil Test!

Maintaining healthy soil is an important step to having an attractive and productive yard and garden and a healthy environment.

Rutgers NJAES Soil Testing Lab

Soil Health and Biological Processes



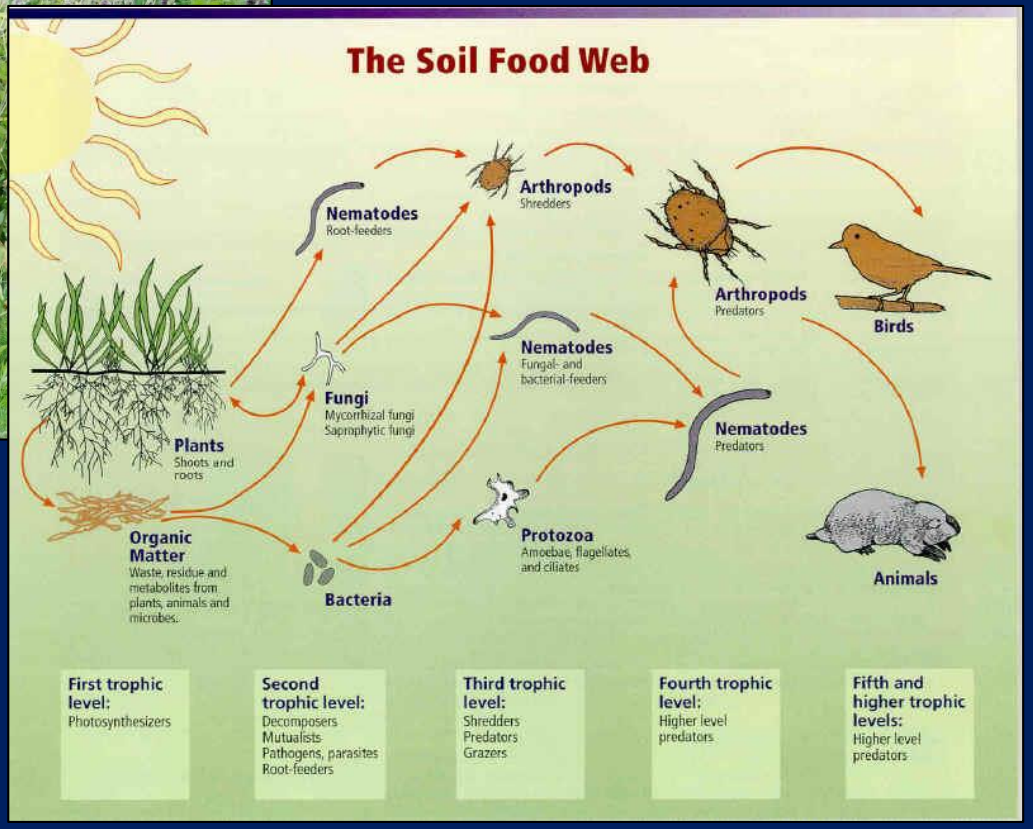
Pest suppression

N mineralization

OM decomposition

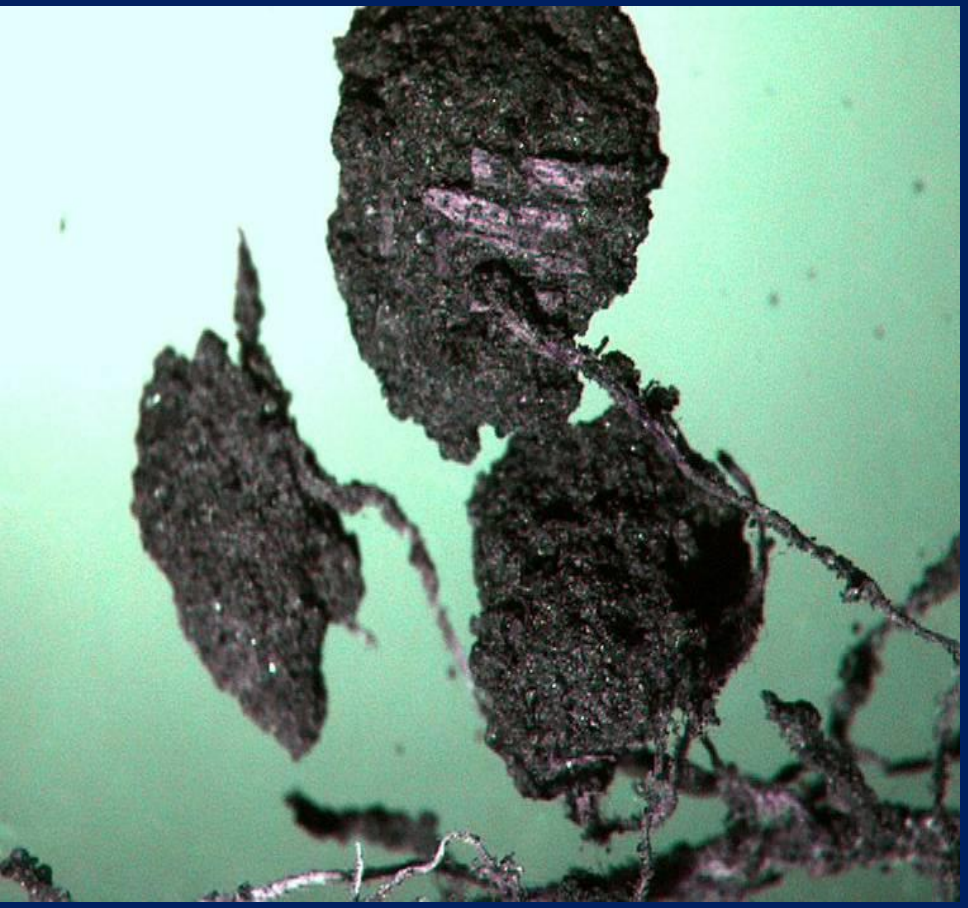
Support of microbial community

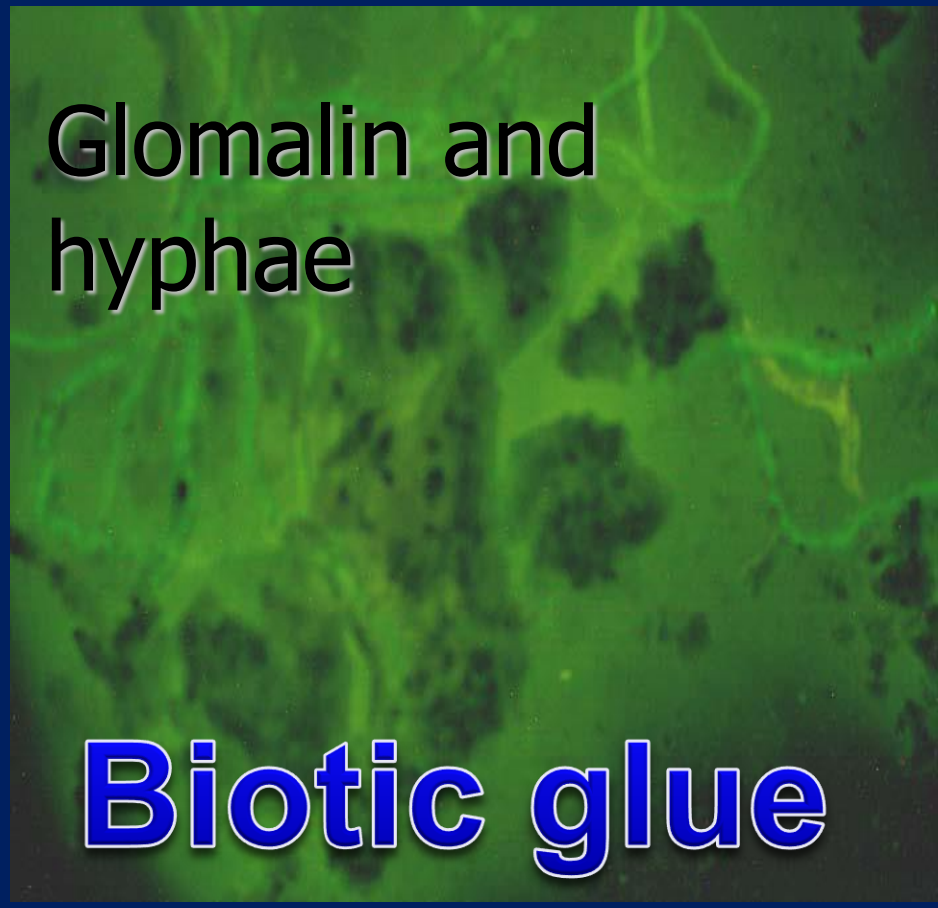
Diversity is the Key!



	Crop Land	Prairie	Forest
	Organisms per gram (teaspoon) of soil		
Bacteria	100 mil. -1 bil.	100 mil. -1 bil.	100 mil. -1 bil.
Fungi	Several yards	10s – 100's of yds	1-40 miles (in conifers)
Protozoa	1000's	1000's	100,000's
Nematodes	10-20	10's – 100's	100's
	Organisms per square foot		
Arthropods	< 100	500-2000	10,000-25,000
Earthworms	5-30	10-50	10-50 (few in conifers)

Root and Mycorrhizal Fungi Association: Enlarged Soil Aggregates





Dr. Kris Nichols, Microbiologist, ARS, Mandan, ND

Soil Management Affects Soil Health

Soil Health Affects Water Quality

Soil Health Affects Air Quality

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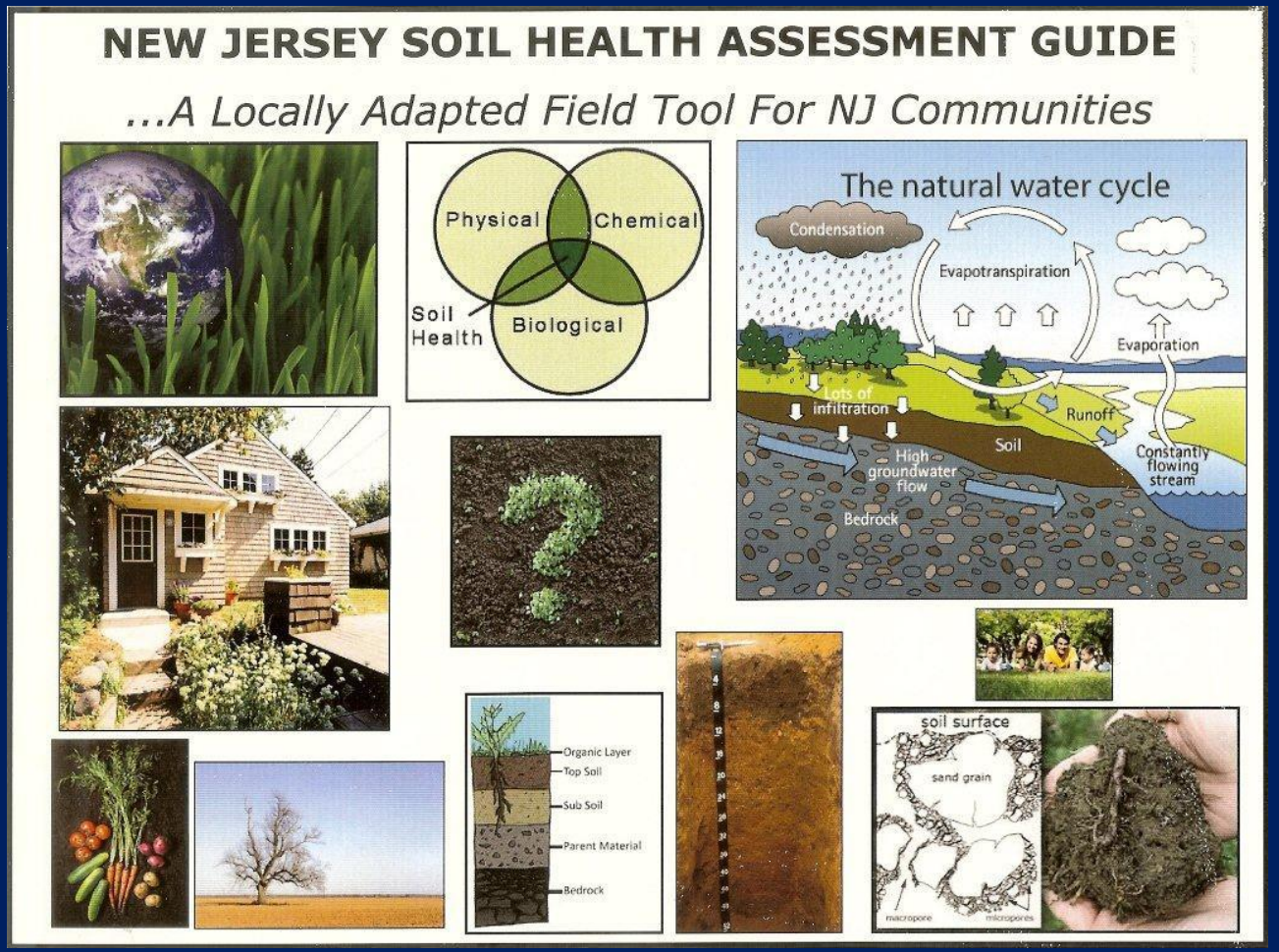
Is Your Soil Functioning?

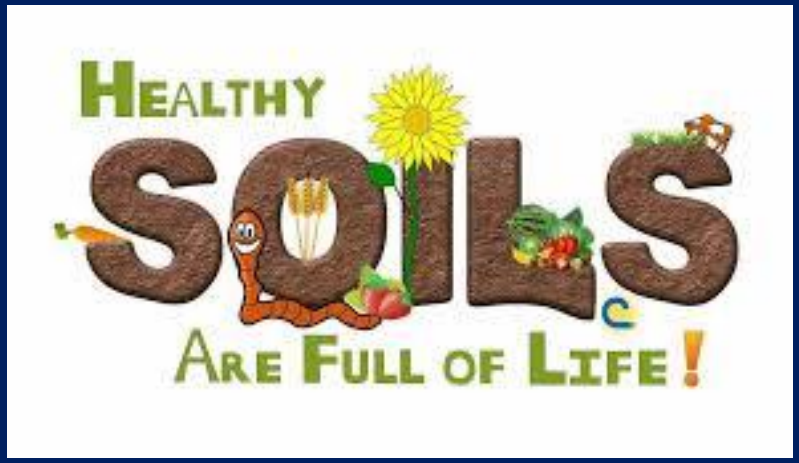
Try this easy to use Soil Health Assessment Guide to better understand YOUR soil.

Step by step evaluation tool that offers improvement strategies.

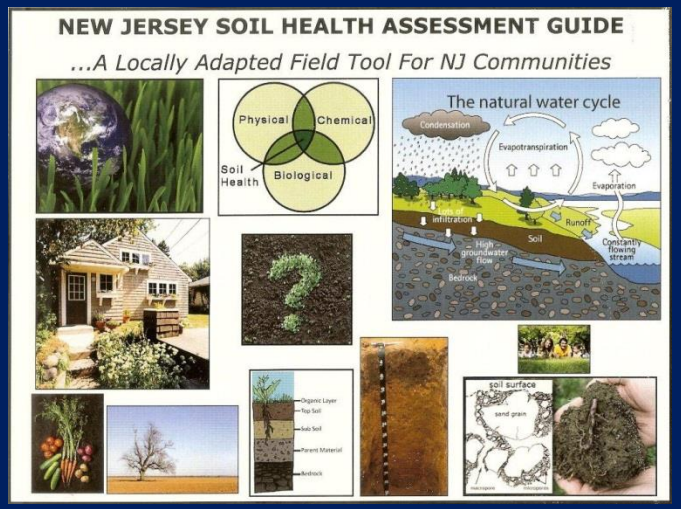


How to Improve Soil Health

- Till the soil as little as possible, preserve the pore space!
- Grow as many different species of plants as possible.
- Keep *living plants* in the soil as long as possible with a diversity of plants.
- Keep the soil surface covered with residue year round.



Resources:



unlock the SECRETS IN THE SOIL

Soildistrict.org

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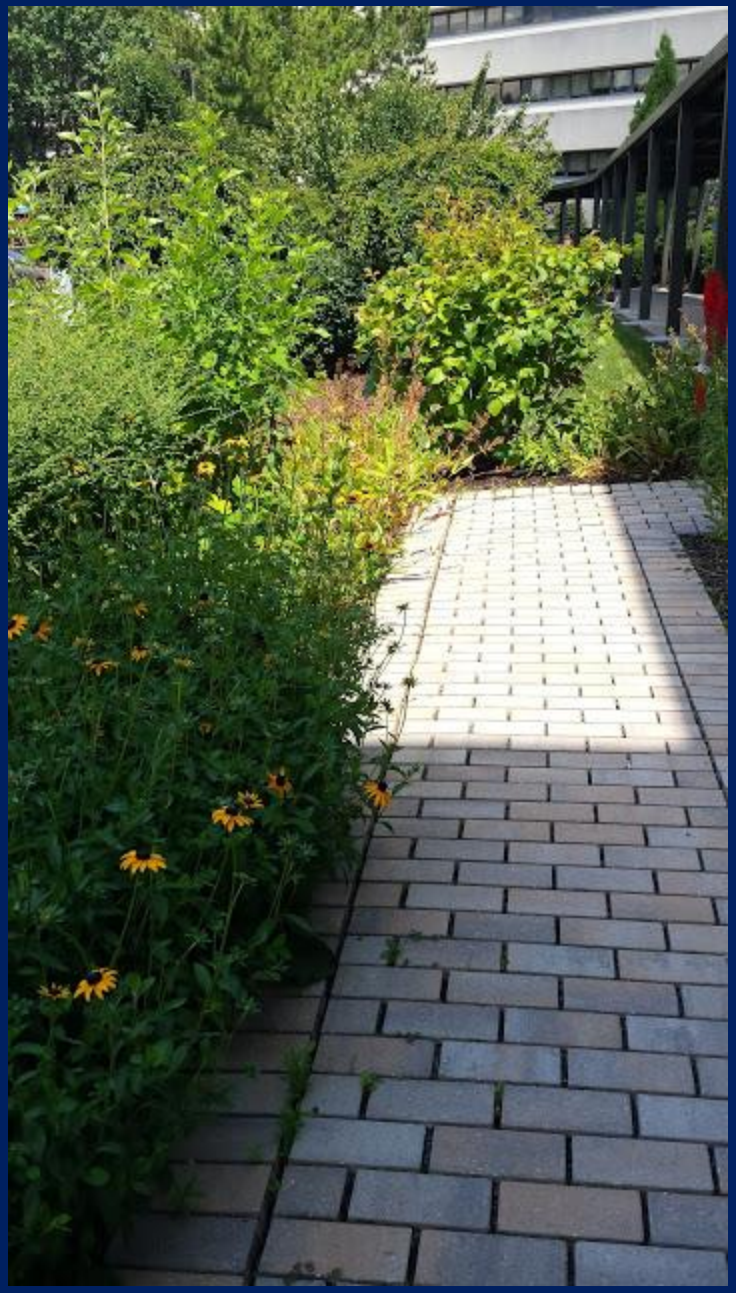
www.jerseyyards.com



Thank You!

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