Soil & Soil Life

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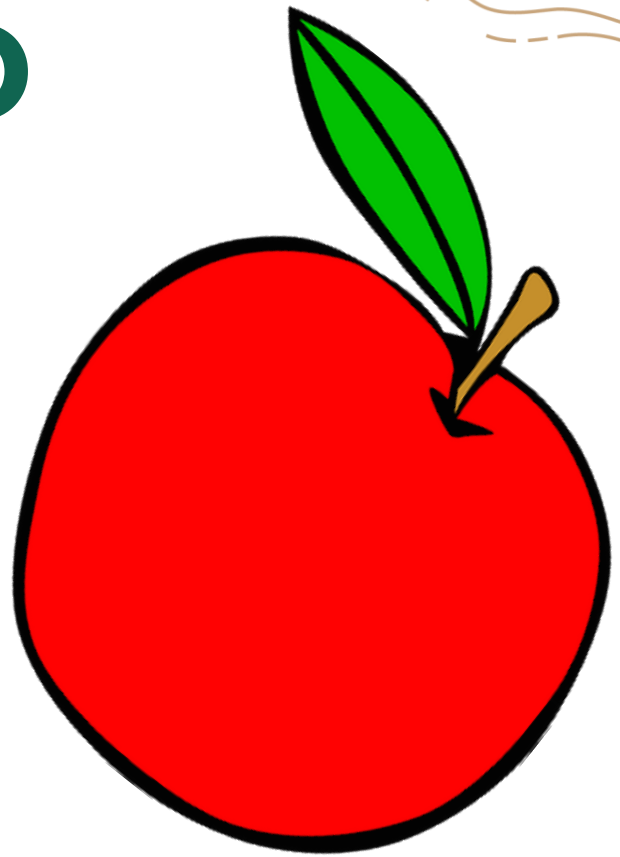
Biblical Connection

2 Chronicles 26:10

Psalm 50:10-12

Apple Demo



Functions of soil

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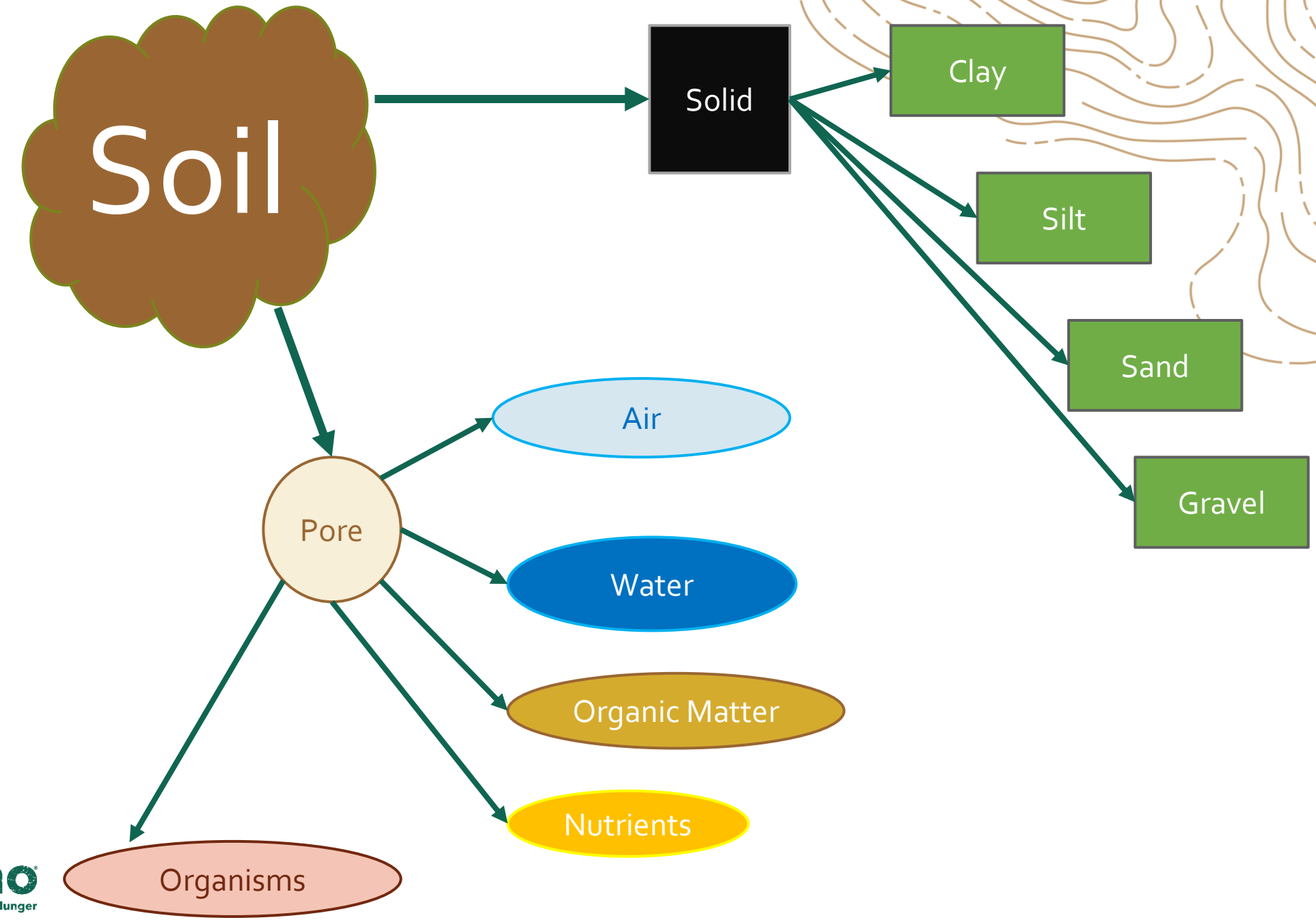


Sand

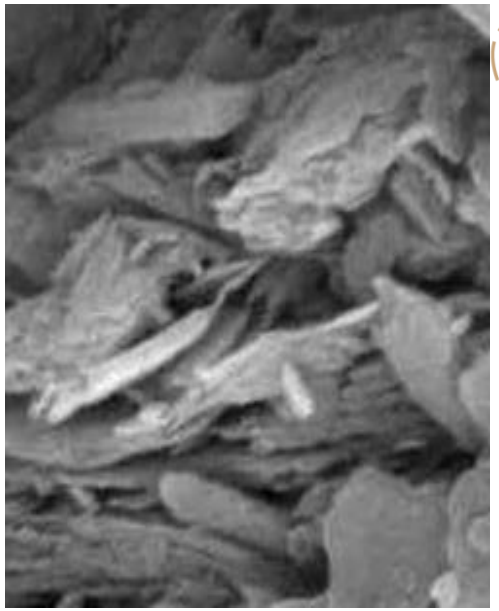
2mm – 0.05 mm

Silt

0.05 mm – 0.002 mm

Clay

< 0.002 mm



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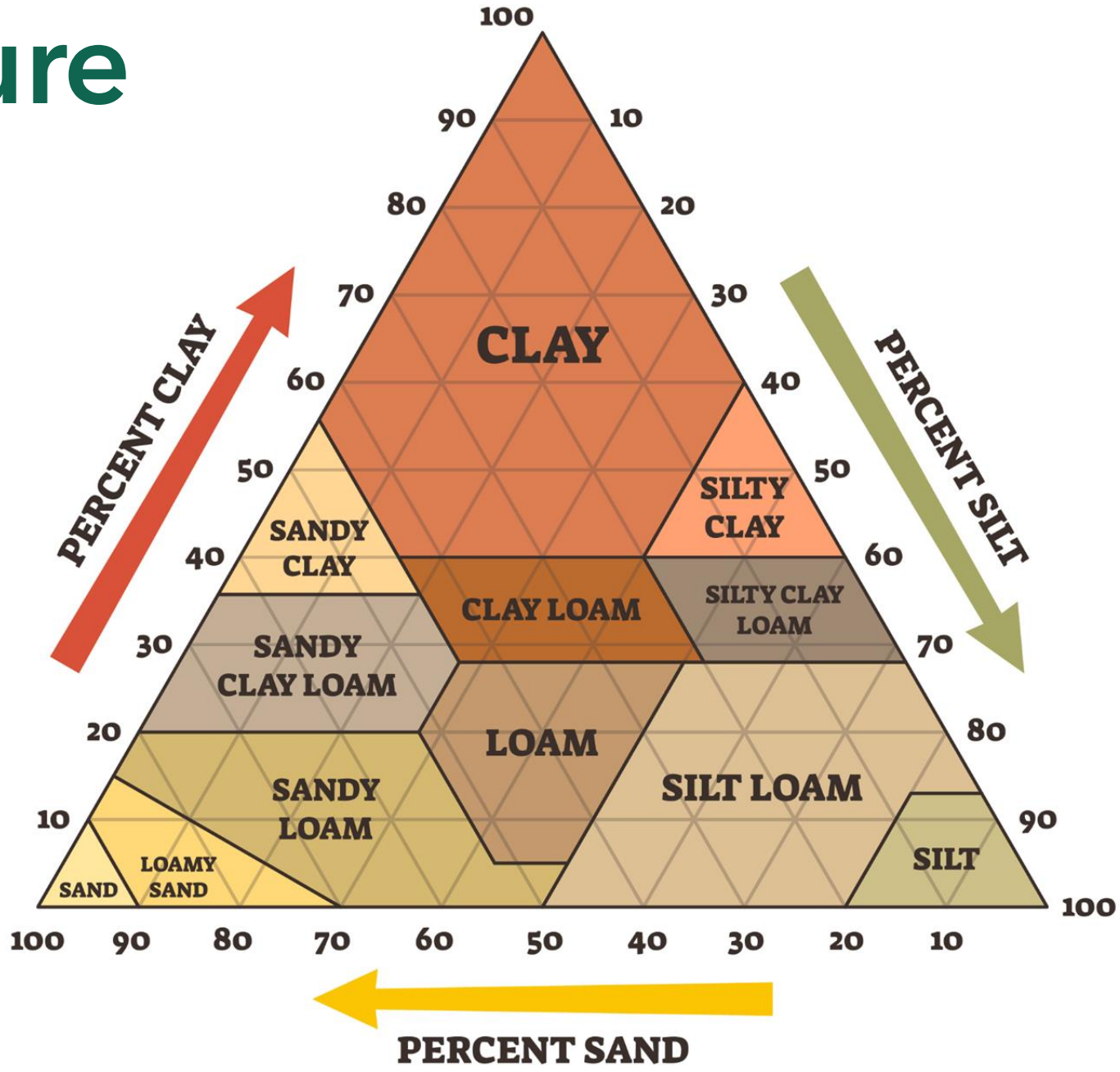
Soil Texture



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Soil Texture Lab

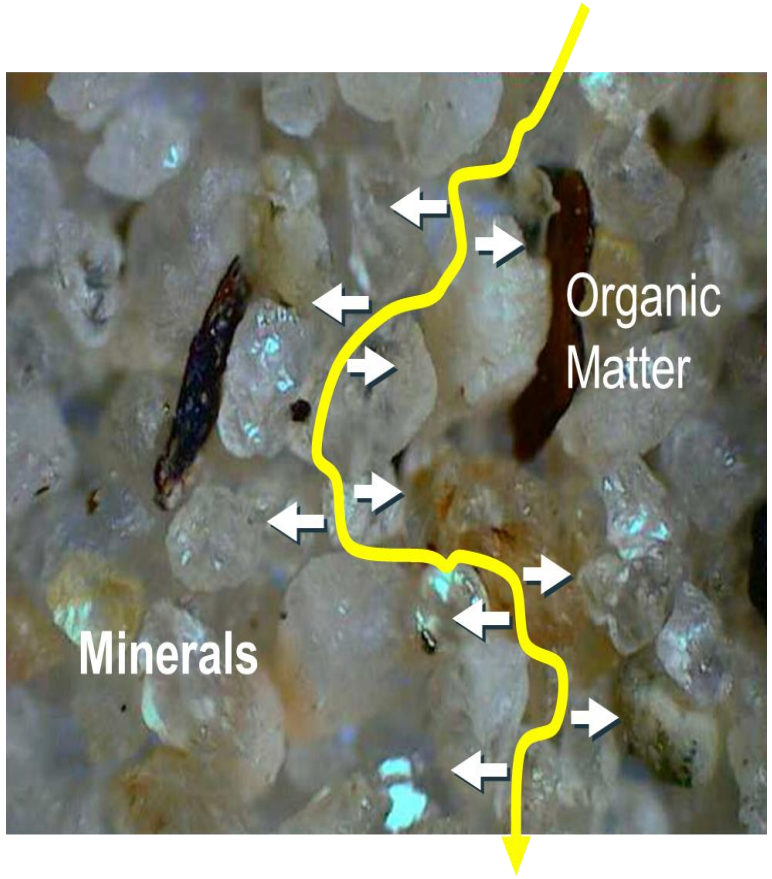
- Fill jar 1/3 full, 2/3 water with 1" headspace with soil and add 1 T powdered dishwashing powder – Shake for 2 min
- In 1 min mark the sand layer; 2 hours mark the silt layer; 48 hours mark the clay layer
- Measure the thickness of layers in mm
- Layer #1 (Sand) / Total thickness of all layers x 100 = % layer
- Layer #1 (Silt) / Total thickness of all layers x 100 = % layer
- Layer #1 (Clay) / Total thickness of all layers x 100 = % layer

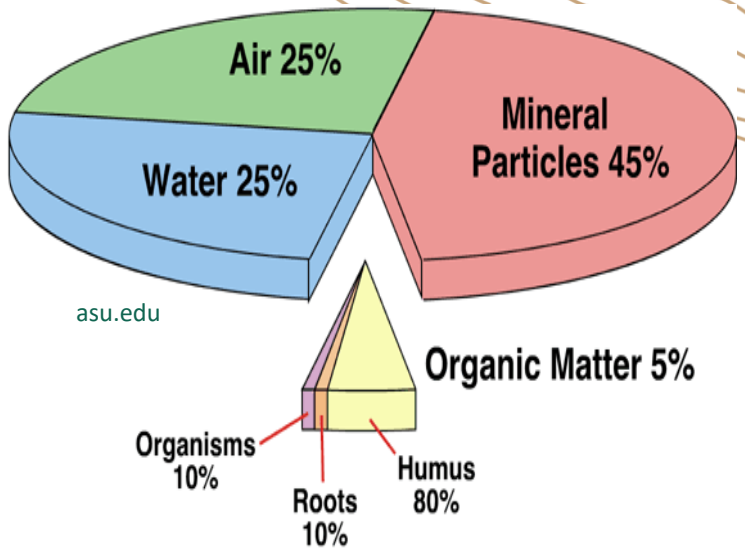
Soil Ribbon Test

- Test 3 soils and note what soil type you observe
- Obtain a 25g soil sample and wet until it has a putty consistency
- Follow the flow chart on the handout to determine soil type

Biblical Connection

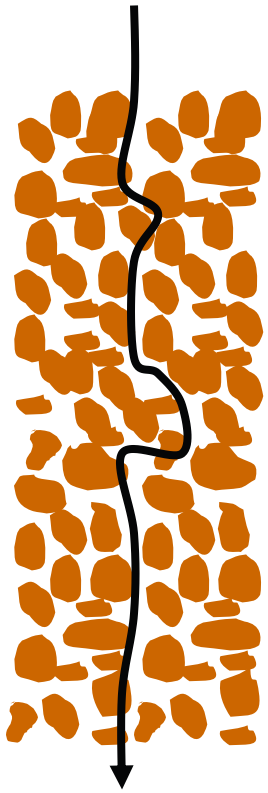
- Genesis 1:9-12
- Genesis 2:8

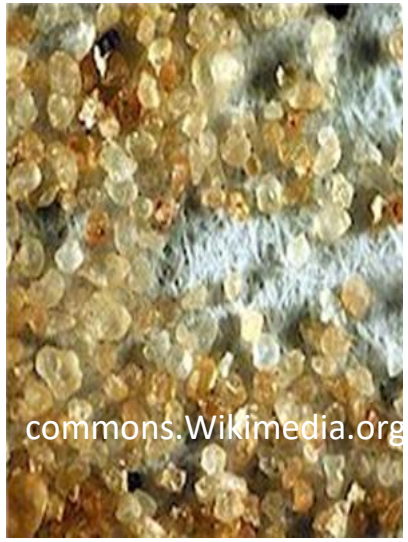

Organic
Matter
Minerals

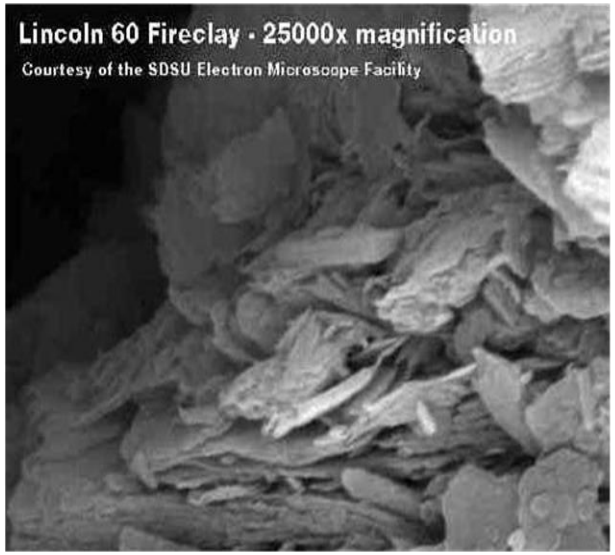

Air 25%
Water 25%
Mineral
Particles 45%
asu.edu
Organic Matter 5%
Organisms
10%
Roots
10%
Humus
80%

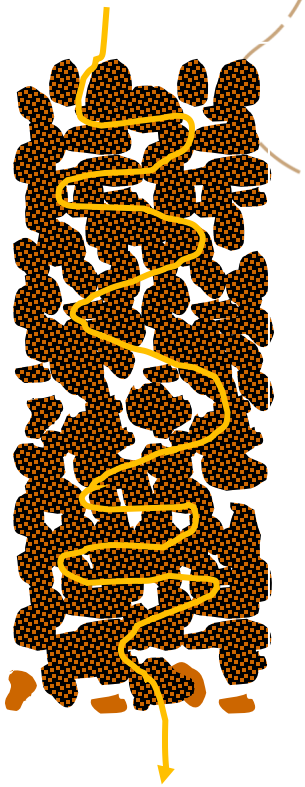

SOLID
LIQUID
GAS

Soil Particles, Water Movement, Water Retention









Organic Matter

- Definition- The residues of dead plants and animals in various stages of decomposition - (once living)

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Why is OM Important?

- Sponge in the soil for life, water, nutrients
- Buffers Soil Problems
- Charged - so nutrients stay in the soil
- Food & Habitat for Soil Life

The “Home” in your Soil

- Soil Texture = The House
- Organic Matter = The Furniture
- Microorganisms = The Family

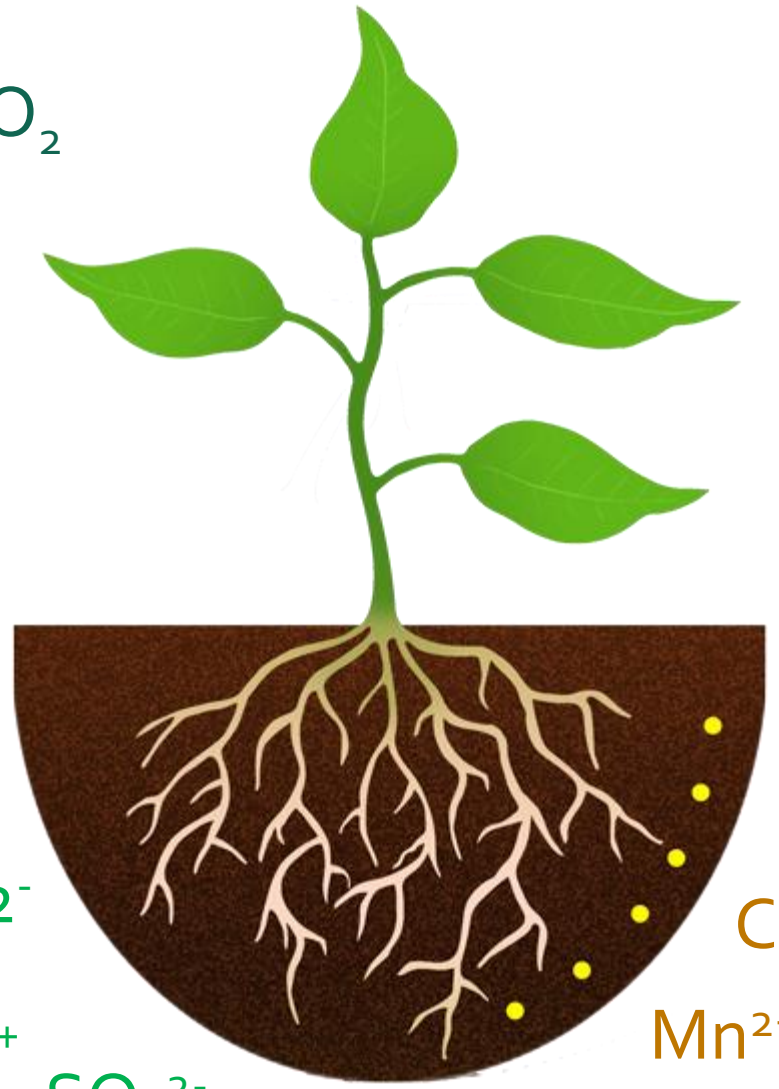
Focus on Factors you can Change

- **Water Movement** - How quickly water moves through the soil
- **Water Holding Capacity** - How much water a soil can hold that is available for Plants
- **Erosion Propensity** - The likelihood that a soil will be moved from its current location to another
- **Soil Life Presence**
- **Organic Matter Presence**

"Good soil structure can withstand torrential rains, the drying of desert-like droughts, herds of animal traffic, and deep freezes. Water and nutrient retention is high. Life in and on it thrives"

-Teaming with Microbes, Lowenfels & Lewis

Soil Chemical Properties



CO_2

O_2

Macronutrients

NO_3^-, NH_4^+

K^+

$H_2PO_4^-$, HPO_4^{2-}

H_2CO_3

Mg^{2+} Ca^{2+}

SO_4^{2-}

Micronutrients

$H_3BO_3^-$ Ni^{2+}

Cl^-

H_2O, H^+, OH^-

Cu^+ or Cu^{2+} Co^{2+}

Mn^{2+}

Zn^{2+}

MoO_4^{2-}

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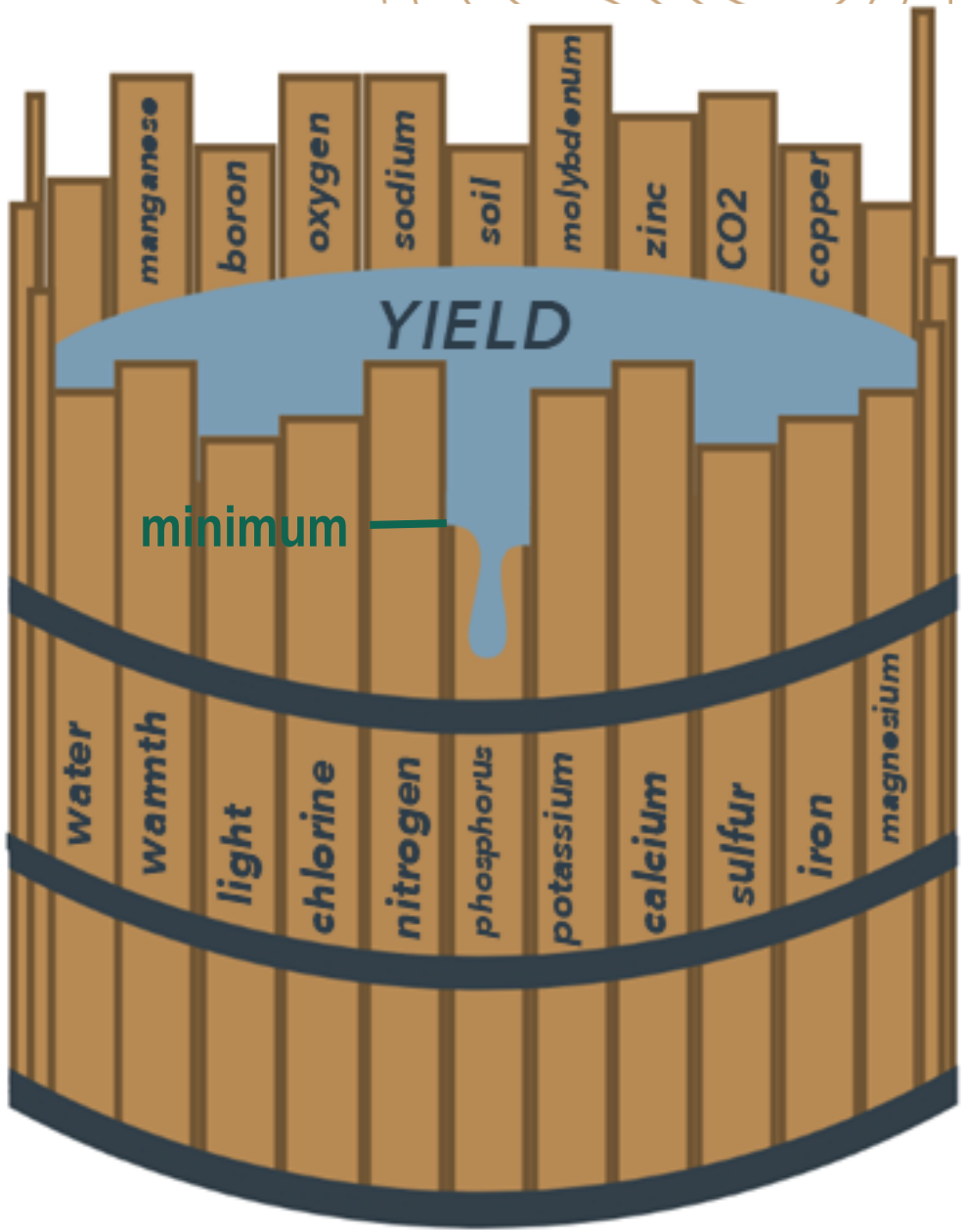
Law of Minimum:

growth is dictated by the scarcest resource (limiting factor), not total nutrients



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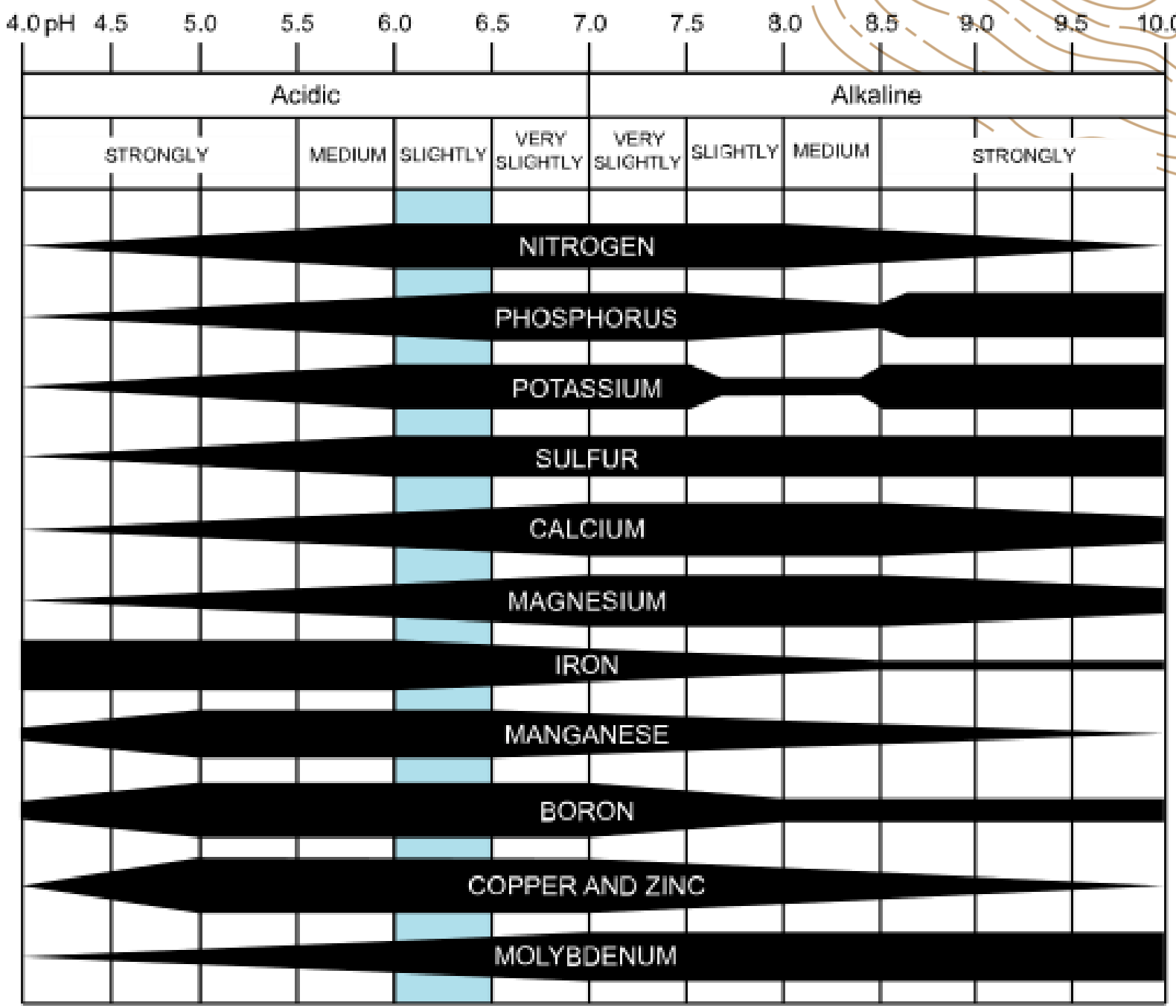
Soil pH



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