



# Soils of Long Island: Benefits & Limitations for Production

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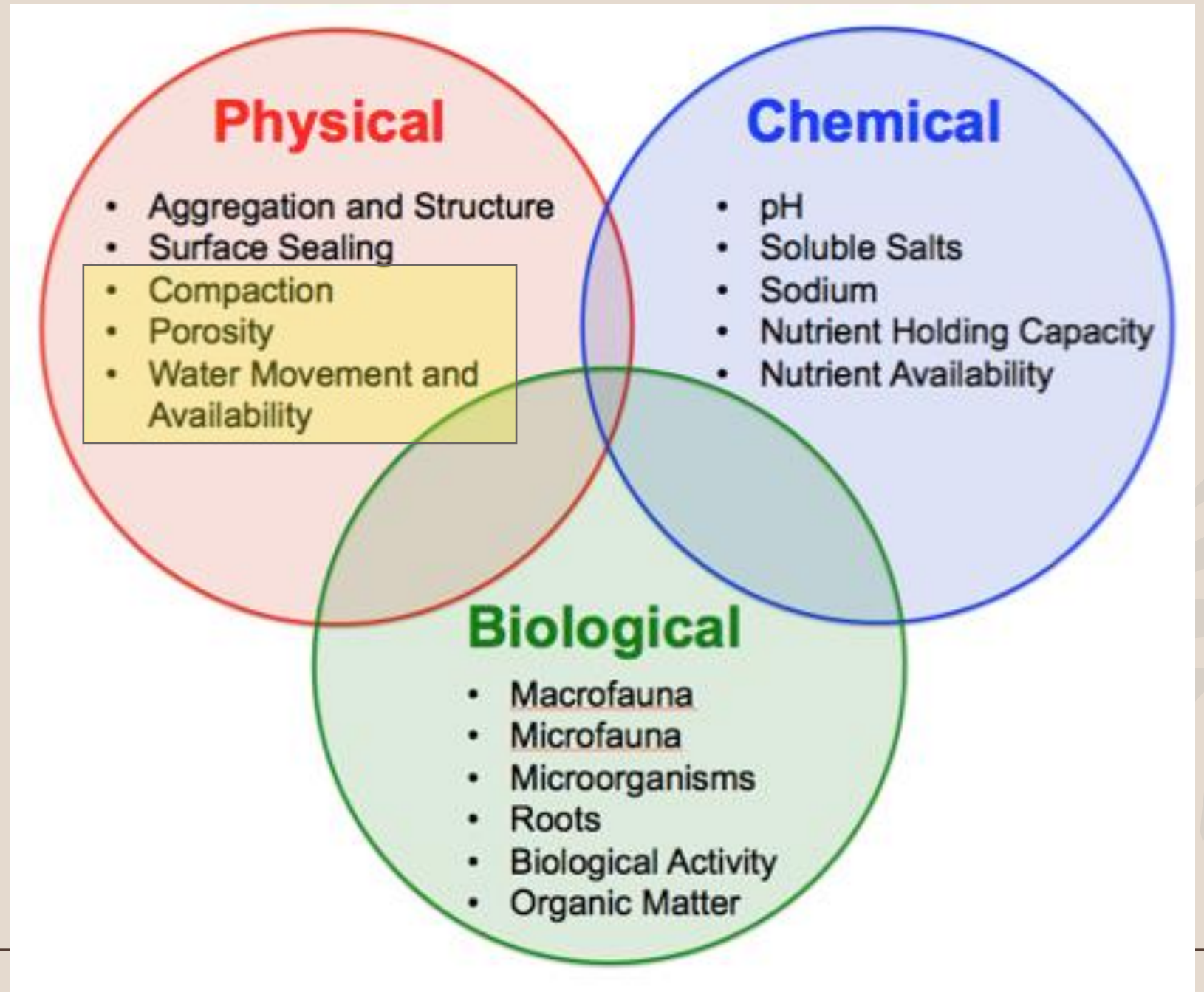
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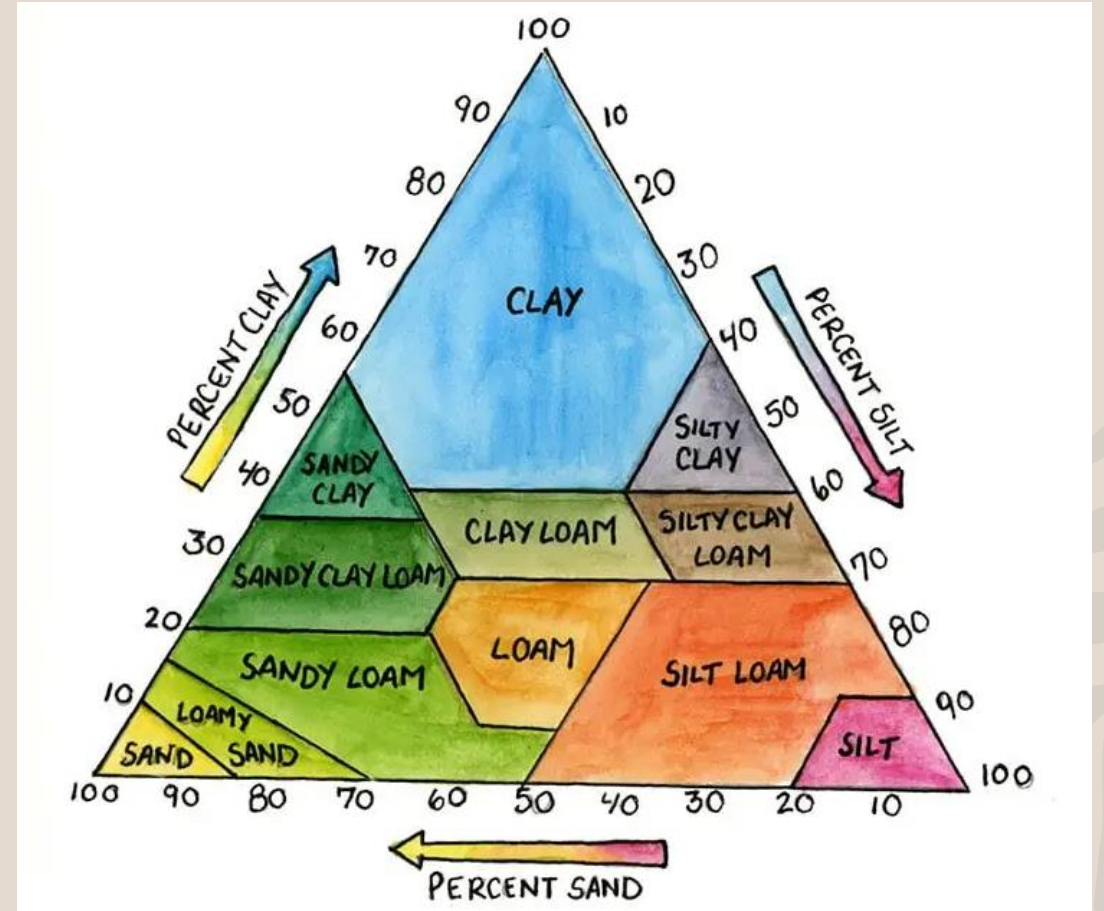
# Soil Health

Solid  
Liquid  
Gas Phases

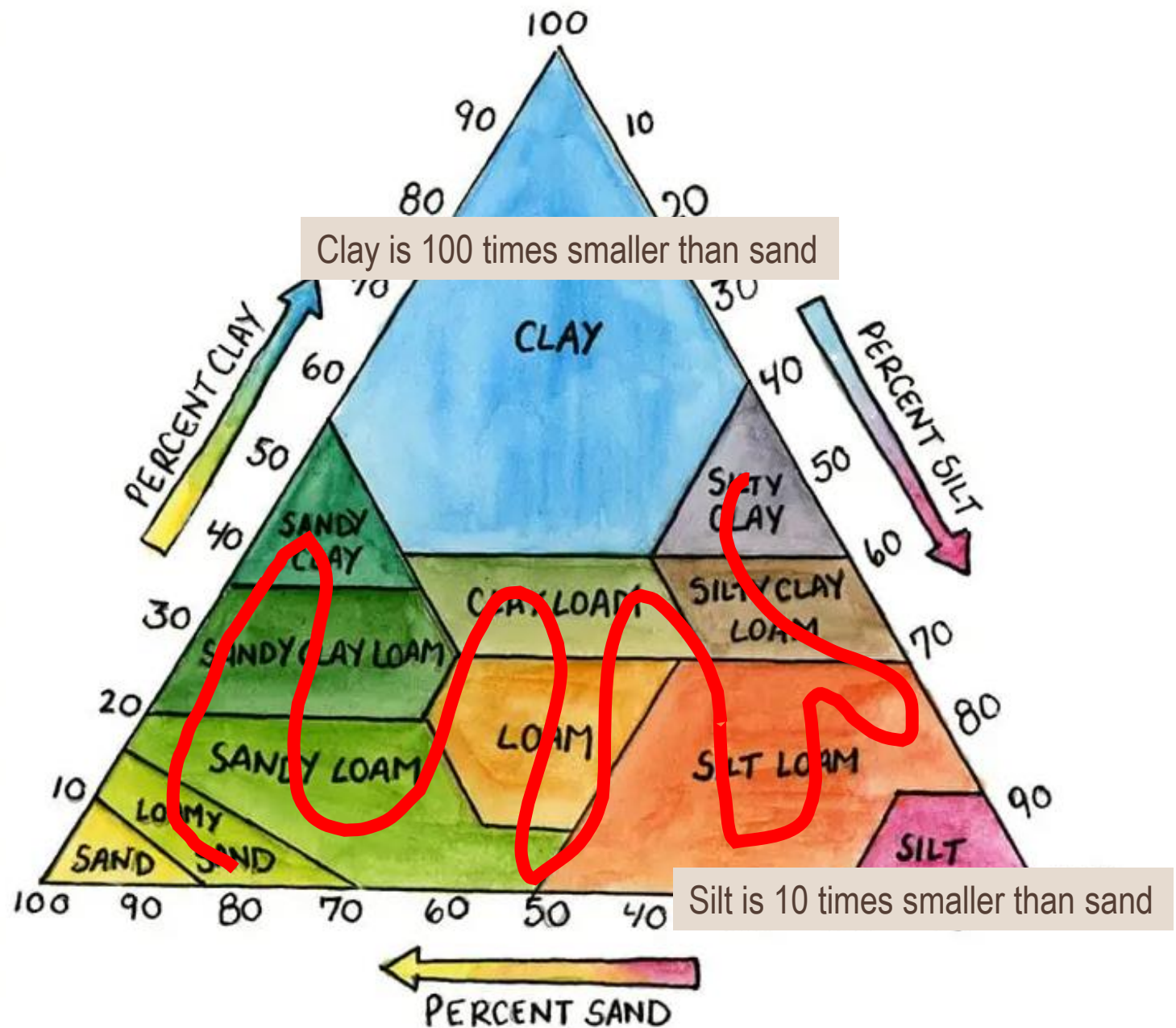


# Today's Focus

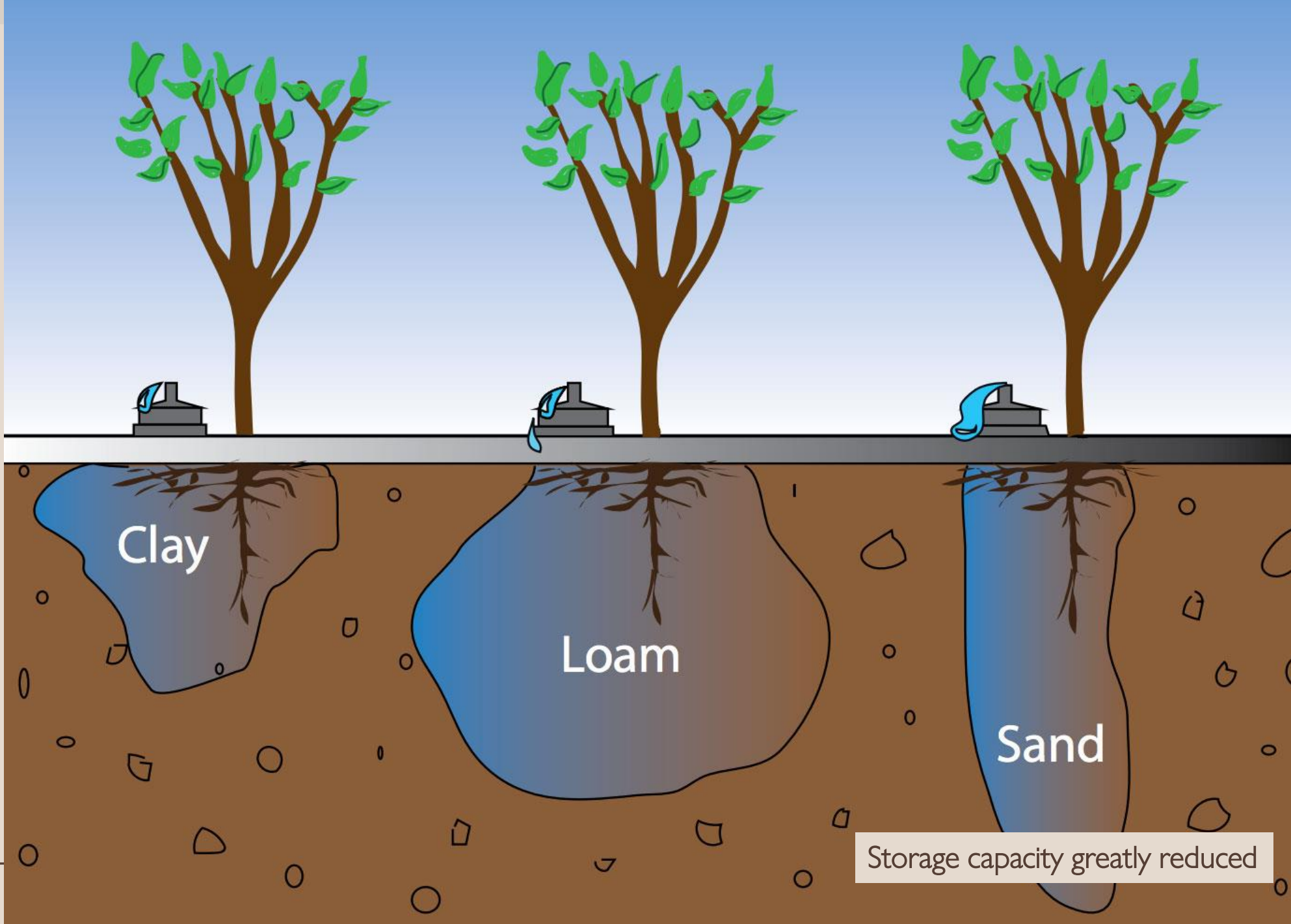
- Get to know your soil before planting – to identify the limitations to your production
- The important role of soil texture in soil water movement and retention.



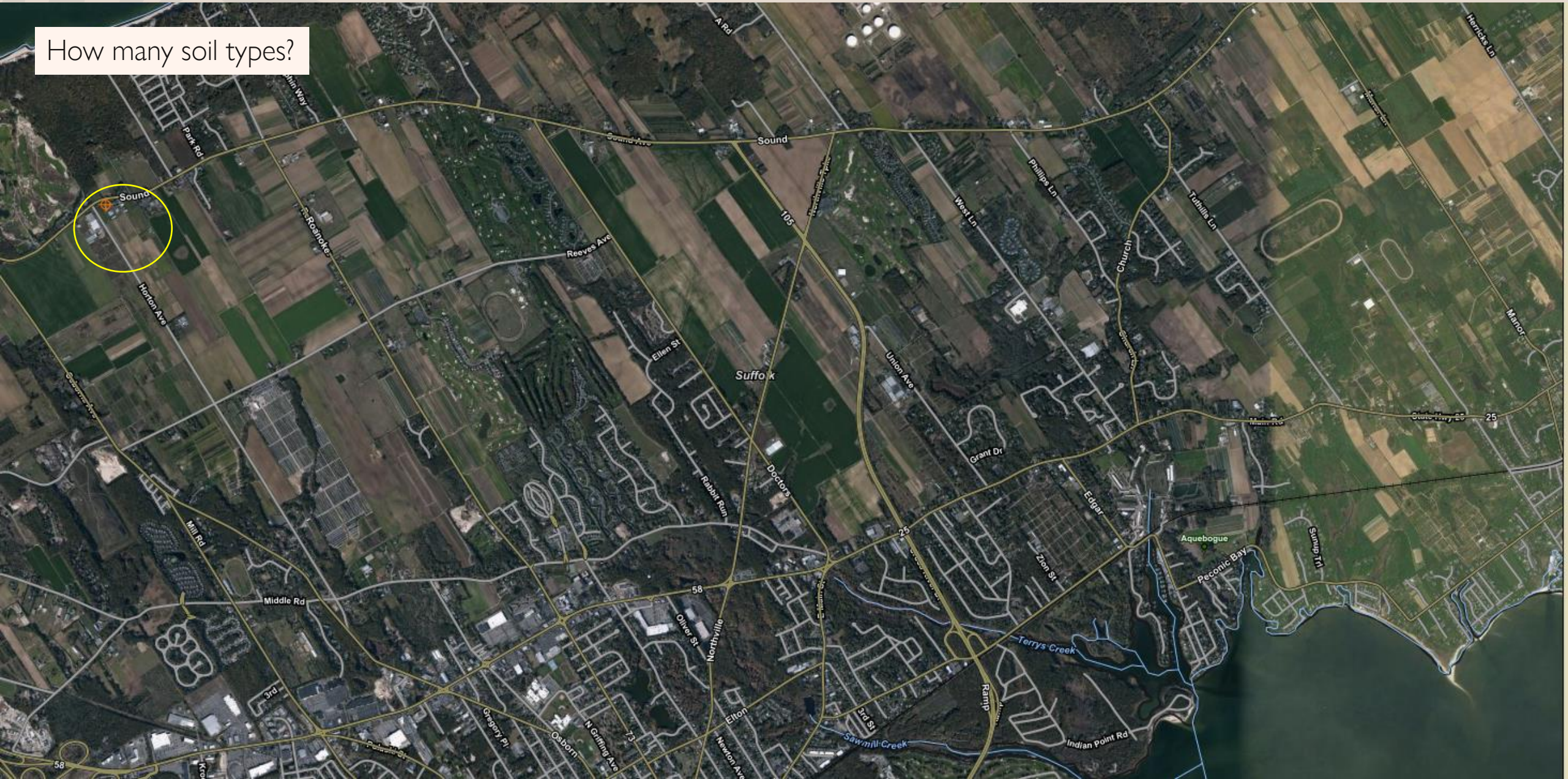
Soil type greatly influences the porosity of your soil, aka how much air space is present in your soil.



Soil texture affects water holding capacity and movement of water through the soil profile.



How many soil types?





What soil texture is this?



Riverhead Sandy Loam



0-10 inches

11-18 inches

19-24 inches

Below 24 inches

Haven Loam

What soil texture is this?



## Search

## Map Unit Legend

## Burleson County, Texas (TX051)

| Map Unit Symbol                    | Map Unit Name  | Acres in AOI | Percent of AOI |
|------------------------------------|--|--------------|----------------|
| WeA                                | Weswood silt loam, 0 to 1 percent slopes, rarely flooded       | 19.8         | 43.2%          |
| WwA                                | Weswood silty clay loam, 0 to 1 percent slopes, rarely flooded | 26.1         | 56.8%          |
| <b>Totals for Area of Interest</b> |  | <b>45.9</b>  | <b>100.0%</b>  |

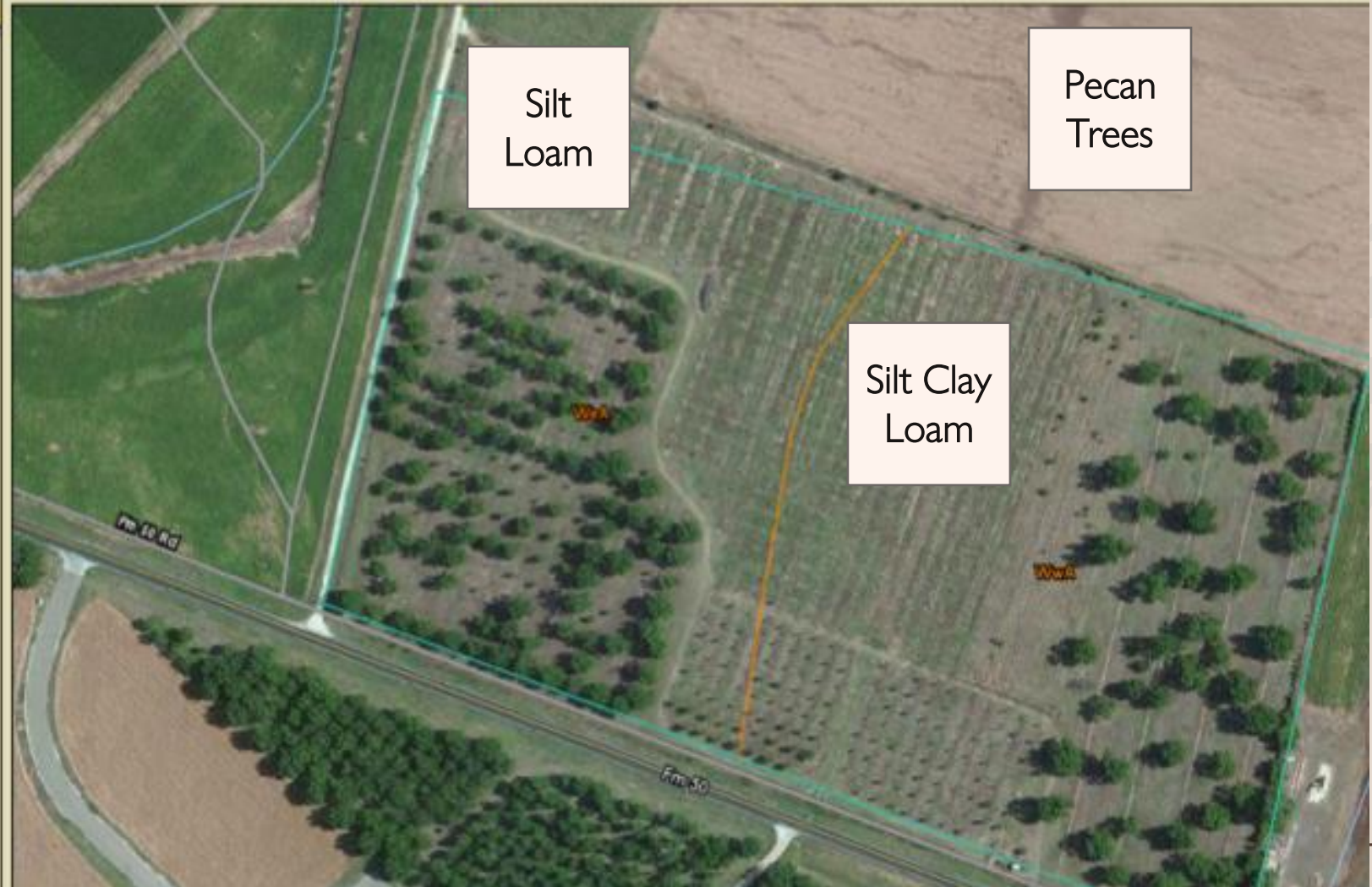
Pecans are fussy with drainage.

Evaluate your soils drainage.

## Soil Map



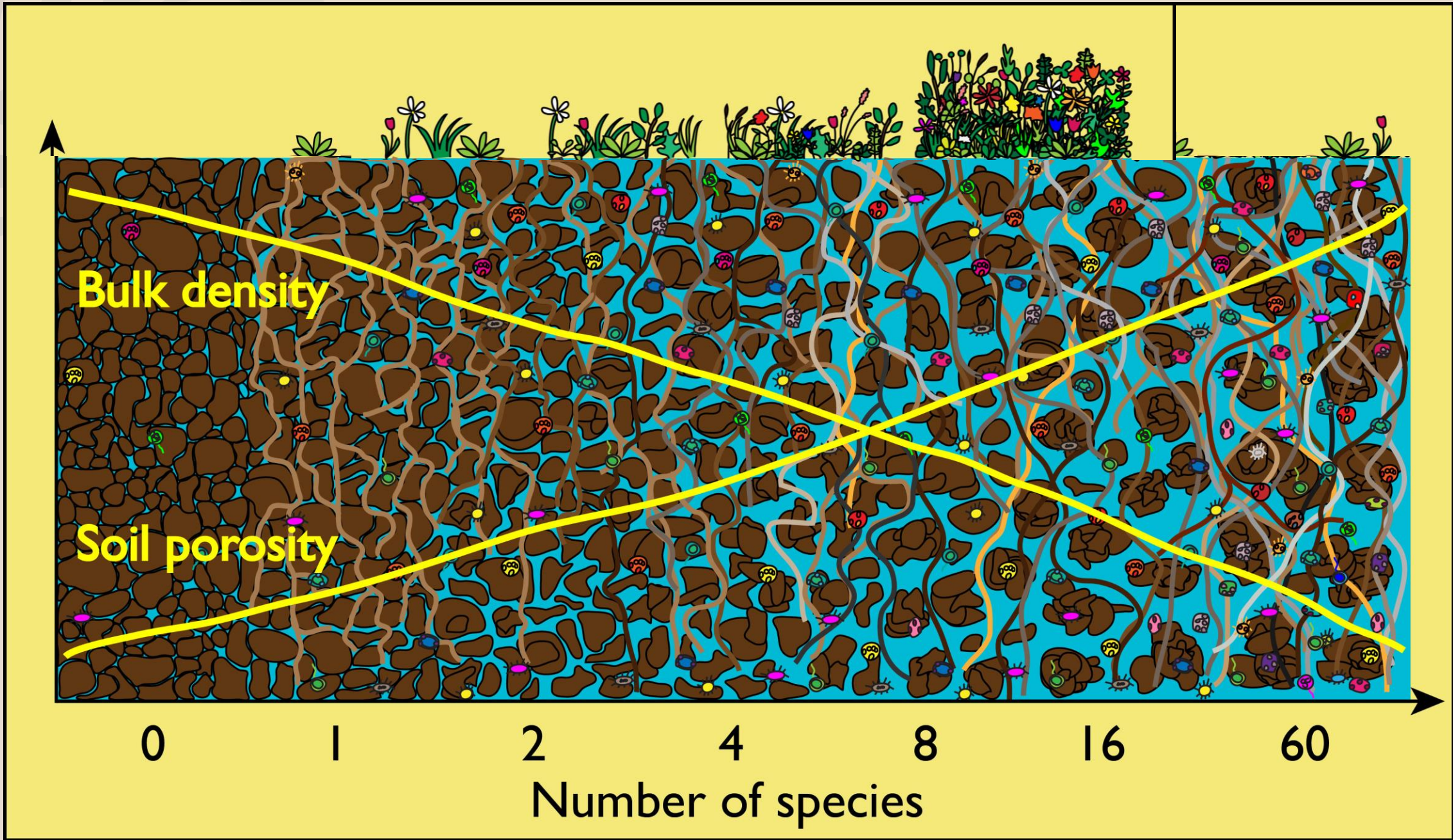
Scale (not to scale)



# Percolation test

Is your soil draining  
too quickly, slowly or  
just right?





Research has suggested that most plant roots need more than 10 percent air-filled porosity to thrive.

# Soil Structure

Increased bulk density =

- Decrease in large soil pores
- Decrease in large soil fauna
- Decrease in root function
- Decrease in tree growth
- Decrease in crop yield
- Decrease in nutrient availability
- Decreased infiltration
- Decreased drainage
- Decrease in aeration – gas exchange



# Soil Texture & Soil Porosity



Brick = high bulk density,  
low pore space



Sponge = low bulk density,  
high pore space

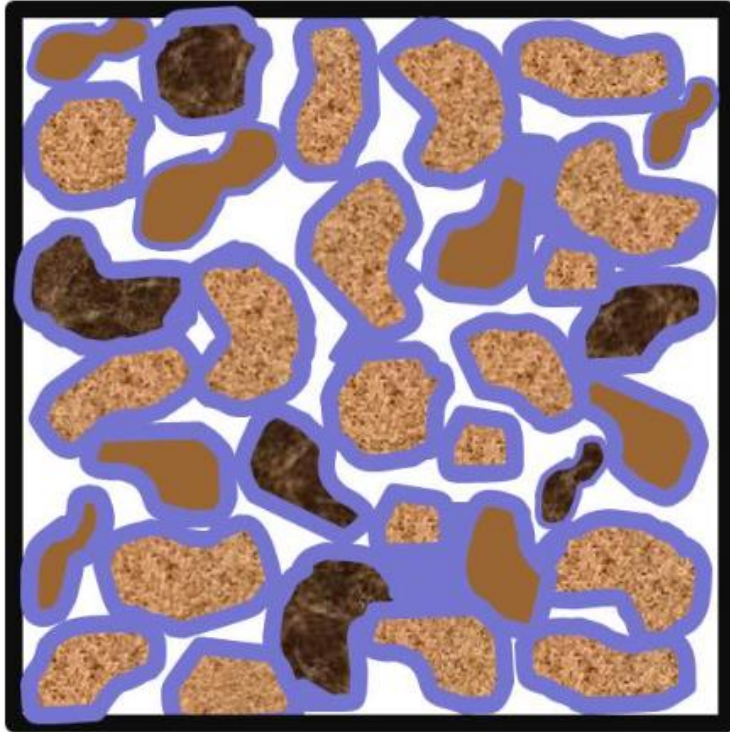
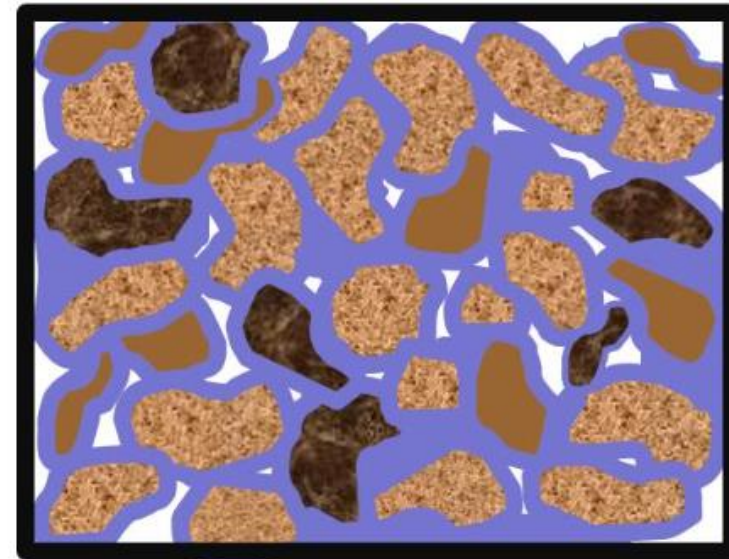
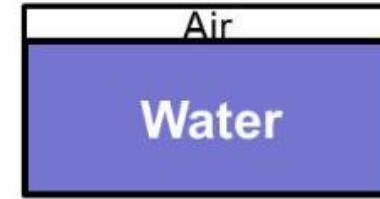


Figure 1: Effects of compaction on pore space.

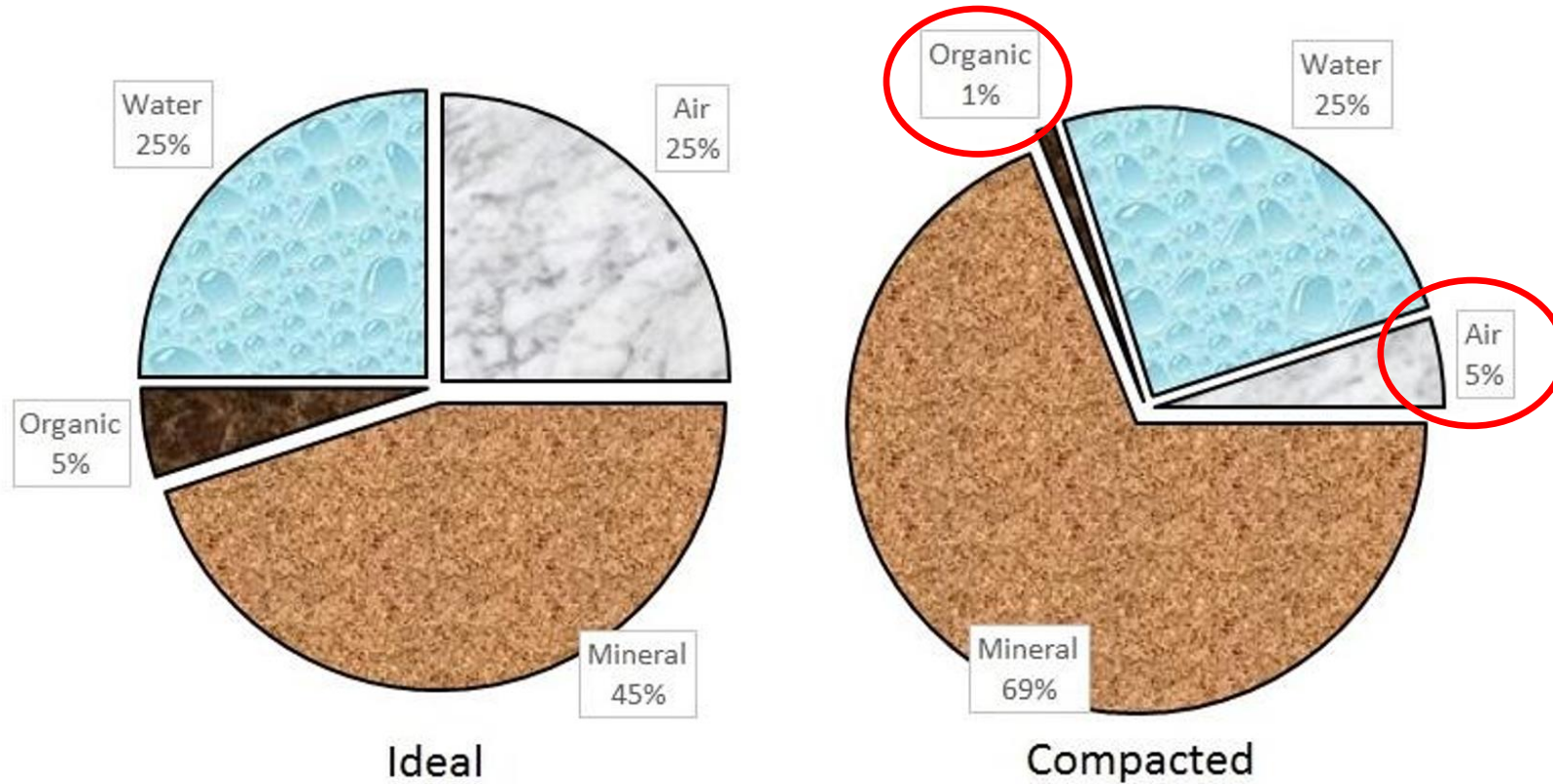
Healthy soil porosity/structure

Reduced drainage due to less large pores.



Compacted soil structure

# Ideal vs Compacted soil composition



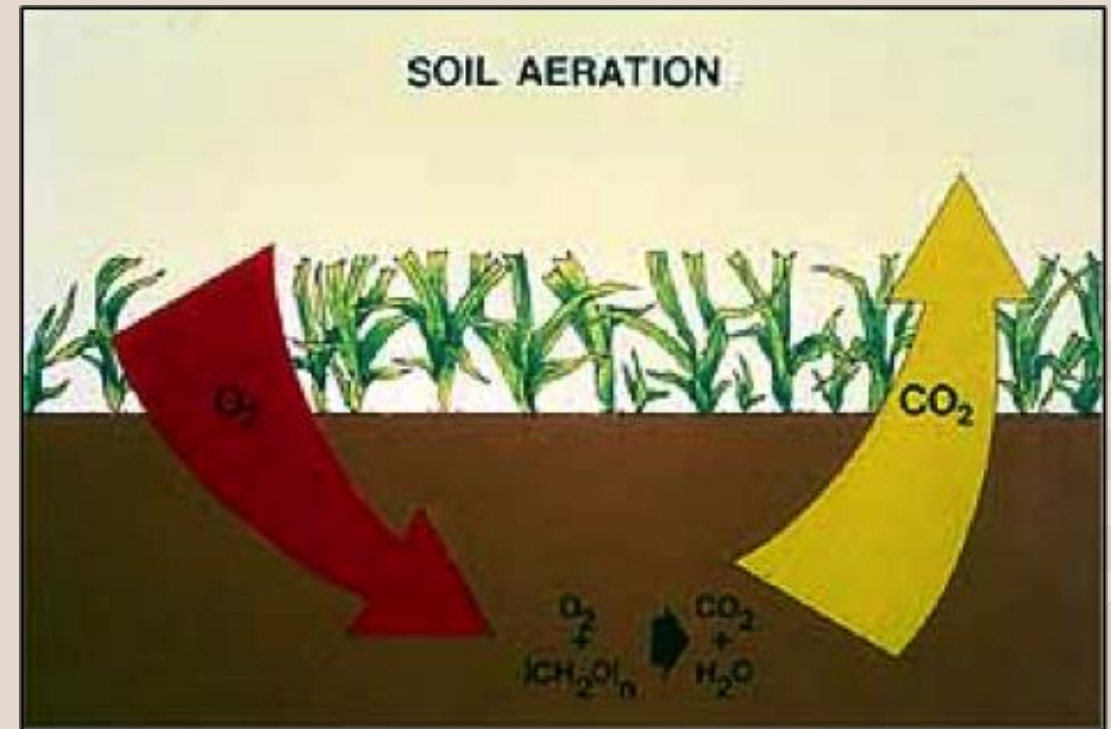
Soil  
penetrometer  
to measure  
compaction



# Does soil breathe?

Nitrogen, oxygen, carbon dioxide and water vapor are the most important gases.

Soil air constantly moves from the soil pores into the atmosphere and from the atmosphere into the pore space.



# Liquid phase - how water & soil texture interact

## **Understanding soil porosity and water-holding capacity using sponges**

**Nina Bassuk, Director, Urban Horticulture Institute  
School of Integrative Plant Science, Cornell University  
Urban Eden Course Demonstration  
Fall 2020**

# Adhesion vs Cohesion – Properties of Water

Water adhering or sticking to another substance.

## ADHESION



Water adhering or sticking to itself.

## COHESION



The background features a light gray base with several organic, flowing shapes. On the left, a large, solid reddish-brown shape curves upwards. On the right, a large, solid olive-green shape curves downwards. A thin, white outline of a leafy branch is visible in the upper left corner. The text "Any questions?" is centered in a dark brown, serif font.

Any questions?