



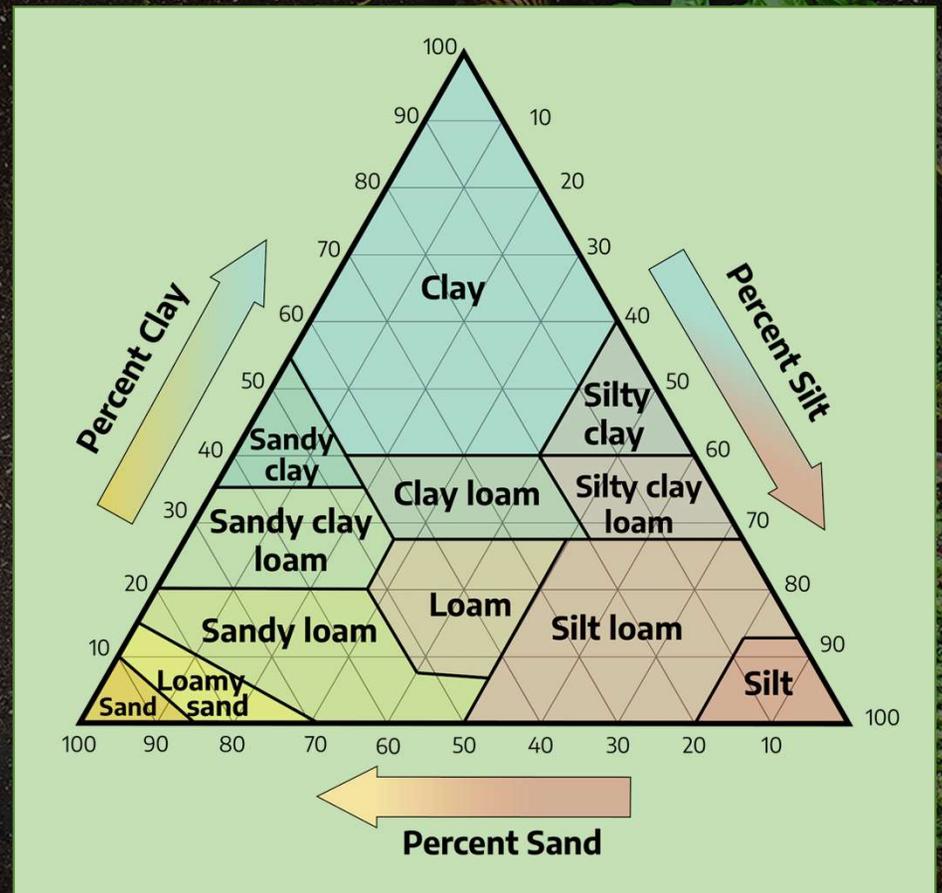
Soils and Substrates in Mayhaws



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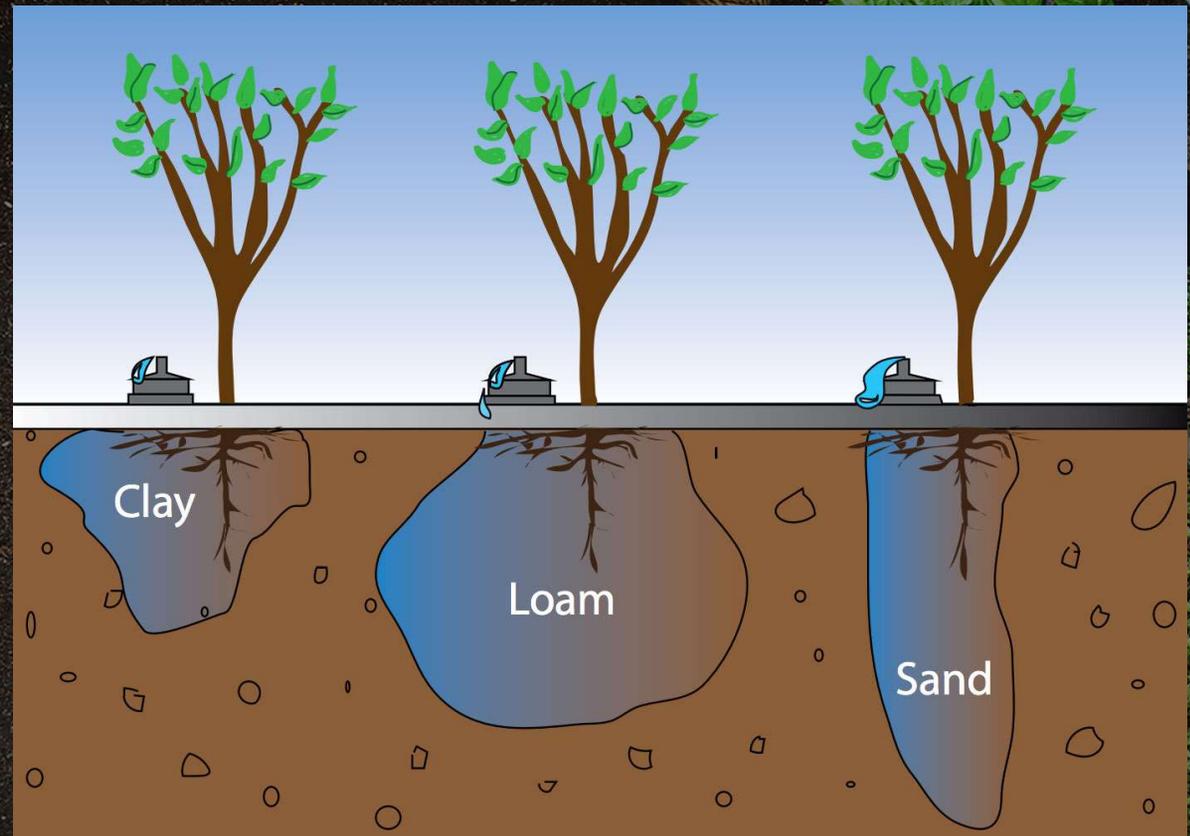
What is a Soil?

- A soil is mineral based.
- The three components of a soil are clay, silt, and sand.
- It is very difficult to make major changes to a soil's composition, but it is possible to add amendments that can ameliorate certain issues.
 - Organic Matter
 - Lime
 - Sulphur



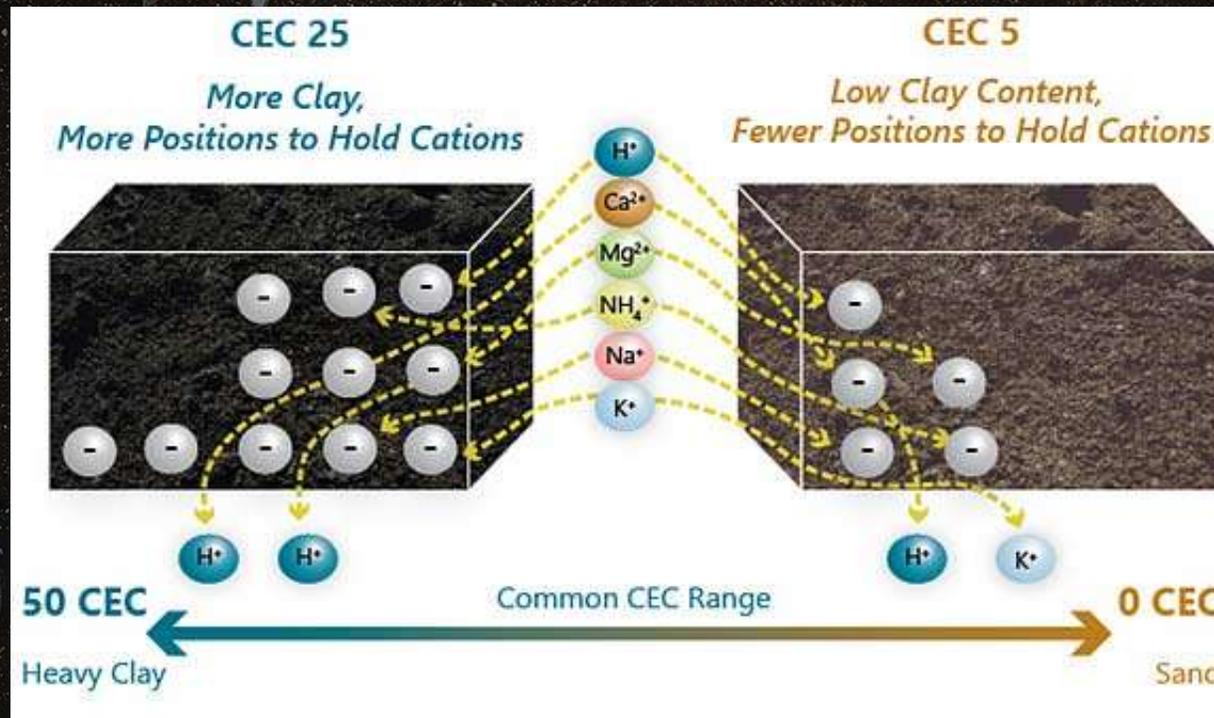
Soils and Water Holding / Drainage

- Soils with higher sand concentrations tend to drain readily, but sometimes too much.
- Soils with higher clay concentrations hold water, but sometimes too much.



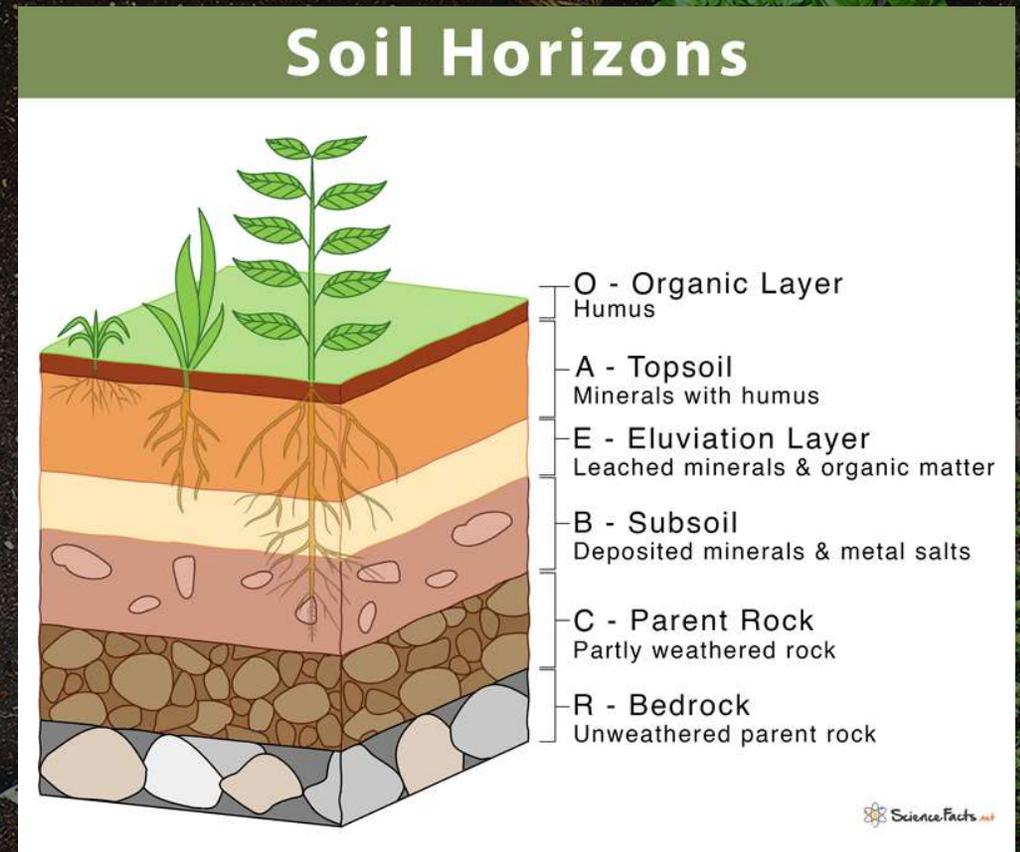
Soils and Cation Exchange Capacity

- One positive of clay is that it has more exchange sites than sand to hold mineral nutrients



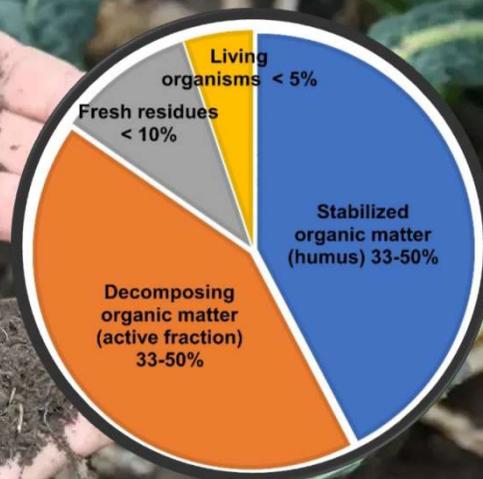
Soil Horizon Layers

- Soils have layers, the top layers tend to be the ones that plants have the most roots in.
- The Organic and Topsoil layers tend to have the most readily available nutrients and where the plant puts most of its feeder roots.
- Plants will still put anchor and some feeder roots in Subsoil.

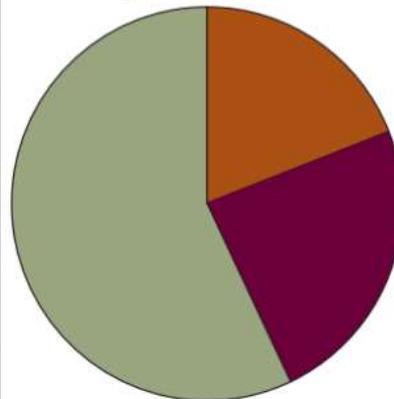


Soil Organic Matter

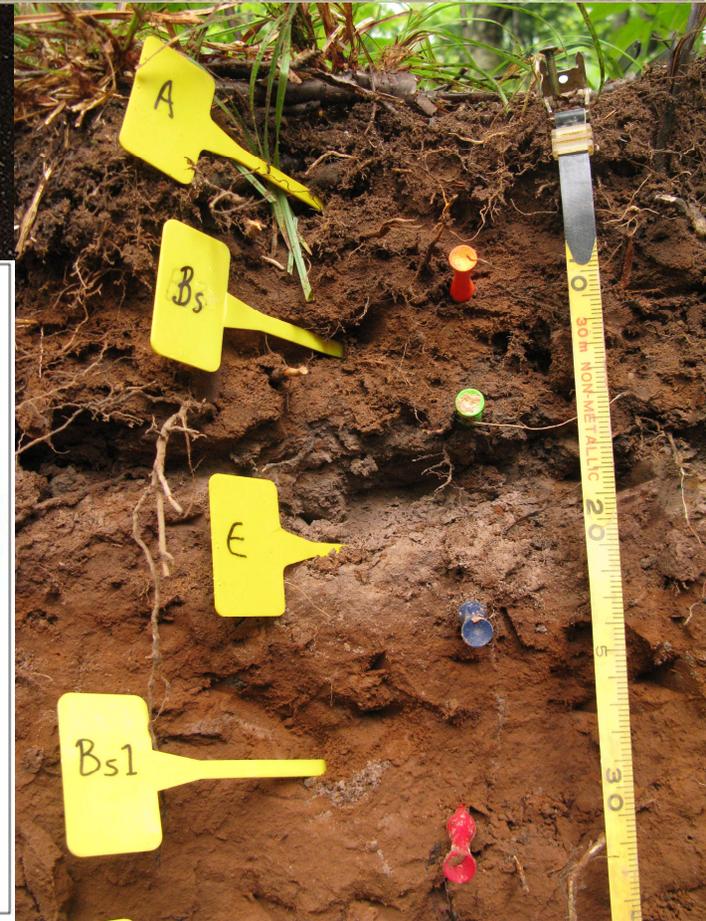
- Plants perform best in soils with moderate to high organic matter content.



Soil Organic Matter Pools

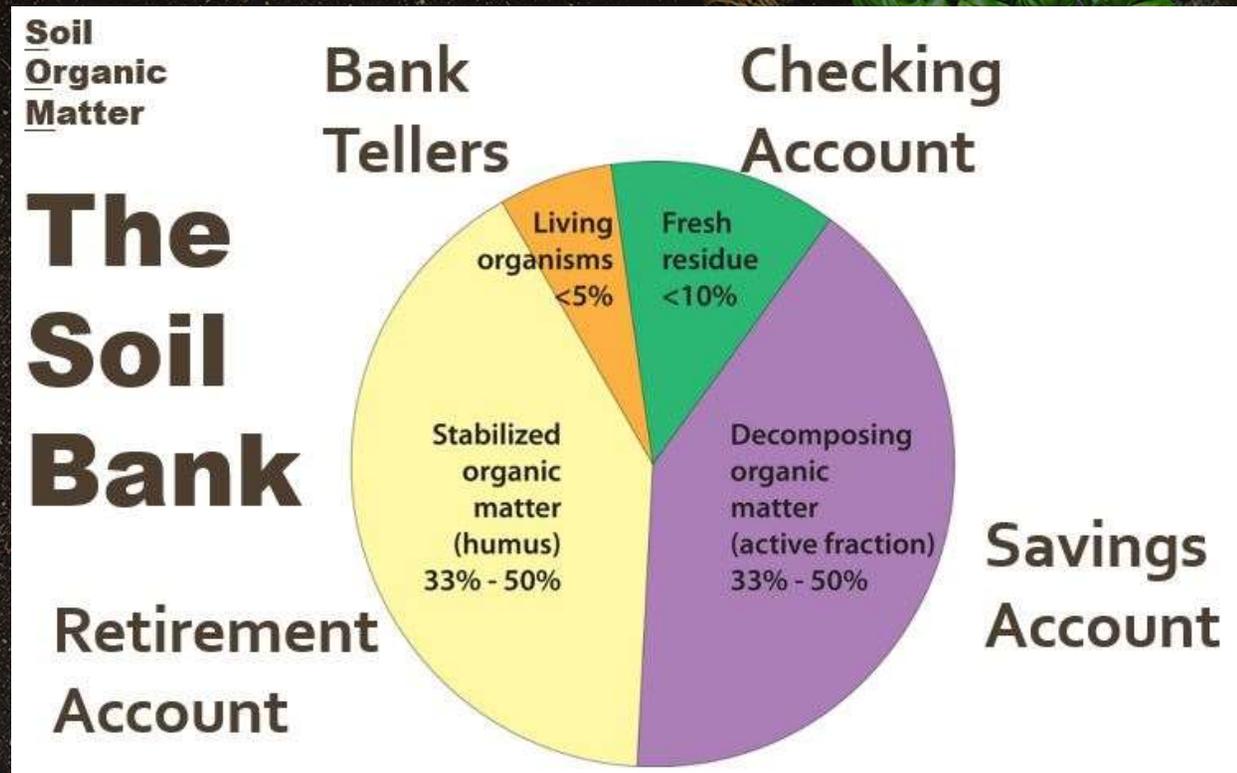


- ACTIVE:** Recent OM inputs and soil organisms
- SLOW:** Organic compounds derived from active pool, protected
- STABLE:** Physically protected humus, extremely resistant to decomposition



Soil Organic Matter as a Bank

- Soil organic matter contains many cation exchange sites.
- Not all nutrients held in organic matter are readily available. Some release easily but others are tied up for the long haul. Ultimately it still stays in the system and should be available eventually.



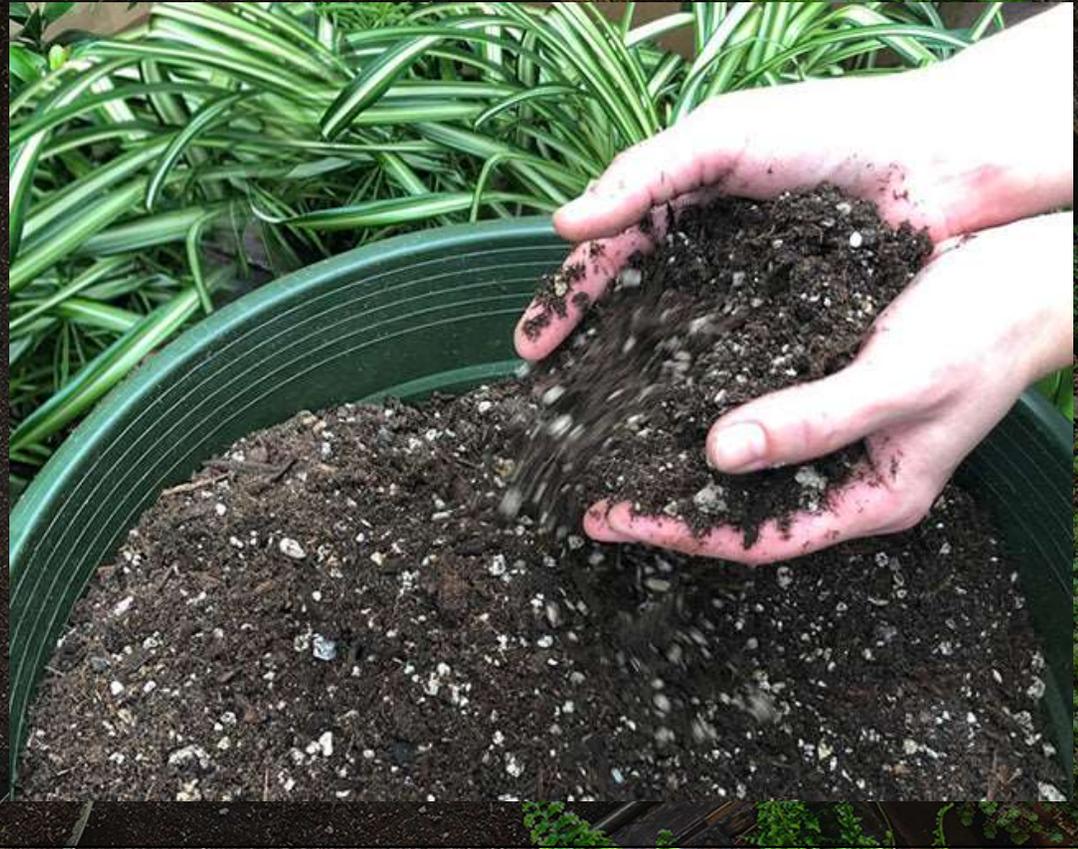
Soils in Mayhew Orchards?

- Can you change what you have? Not really but ...
- Adopting practices that increase soil organic matter can make significant improvements.
- You can still make temporary changes to soil pH through liming or adding sulphur.



What is a Substrate?

- A Substrate is organic matter based that is used to grow plants in containers.
- It maintains desirable characteristics like drainage and CEC.
- Soils in containers often experience compaction that hinders plant growth.
- The most common in our area are bark or peat based



Substrate Amendments

- Substrates can be amended readily in mixing to increase desirable characteristics or reduce negative ones.
- Common amendments are Lime, Fertilizer, Perlite and Vermiculite



Substrates for Starting Plants?

- For germinating seeds, you are usually going to want a substrate that holds more water.
- Most germination mixes are peat-based substrates



Substrates for Growing Plants?

- For growing plants in long-term and in larger sizes, you are going to want something that drains well and holds water at a moderate level.
- Pine bark substrates are ideal for this.



Container Considerations

- Container size and type
- Plant maturity size
- Drainage in pots.



Container Considerations : Drainage

- Make sure your container has a drainage hole so that it does not hold water and cause root rot.
- Periodically check to make sure roots have not grown through the drainage holes. If they have, it is generally a good sign that the plant should be moved up to a larger container.



Container Considerations : Drainage

- The #1 thing to consider for drainage in containers is what substrate you are growing in.
- Different substrates have varying water holding capacities.
- You can add perlite and vermiculite to modify characteristics. Both aid in drainage but vermiculite can hold more water than perlite.



Container Considerations : Drainage

- Don't add gravel to pots to improve drainage. It creates a perched water table and essentially reduces the size of the pot.
- Gravel can be a useful tool when growing plants in some untraditional containers without drainage holes.



The wettest soil is at the bottom.



Gravel moves the wettest soil up in the pot, closer to the roots, which can lead to rot.

